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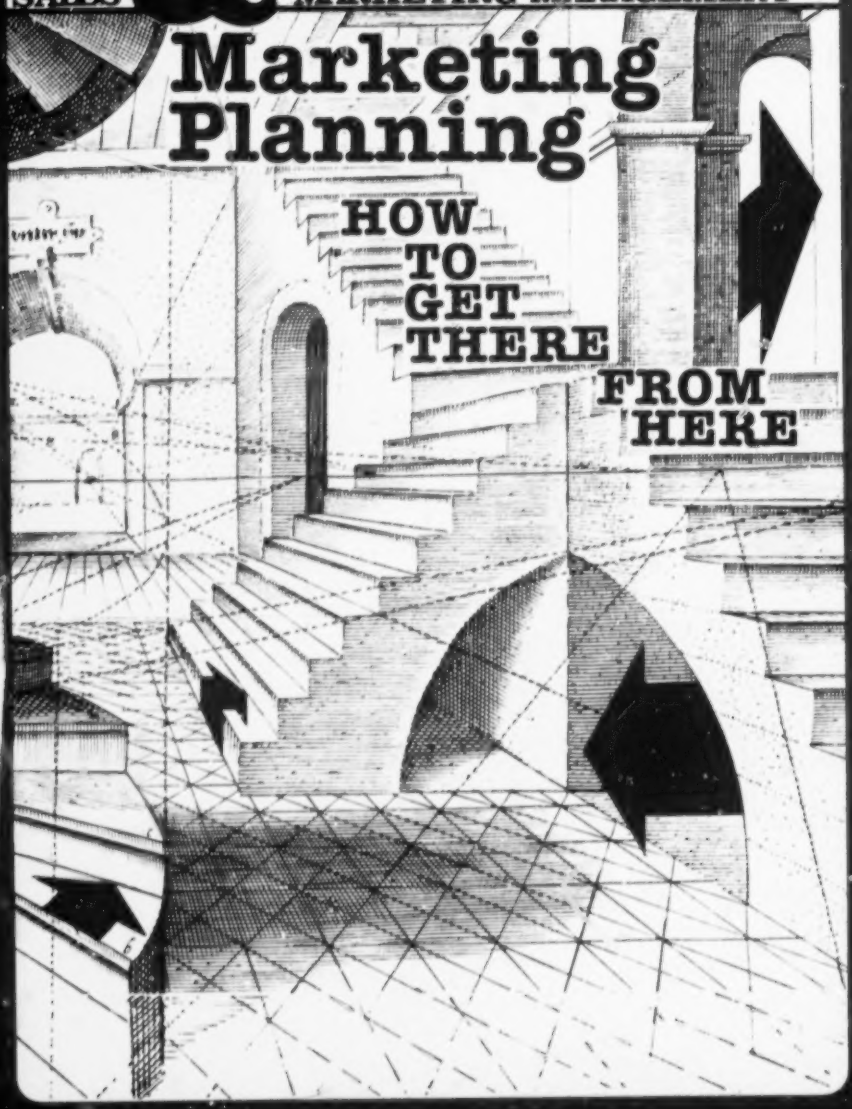
SALES & MARKETING MANAGEMENT

SPECIAL REPORT

S&MM SALES & MARKETING MANAGEMENT

# Marketing Planning

## HOW TO GET THERE FROM HERE



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**An S&MM Special Section: Audiovisuals.** An exclusive survey uncovers new uses of AV equipment, what managers look for when choosing equipment, and how AV budgets are changing. Jan. 18.

**An S&MM Special Section: Trade Shows.** As sales-call costs skyrocket, more companies, both large and small, realize the value of exhibiting in carefully chosen trade shows where prospects come to them. Feb. 8.

**Marketers go p-o-p.** Some 60% of all buying decisions are made at the point-of-purchase. Find out what marketers in a variety of industries do to help their customers make the right decisions. Mar. 15.

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ABP MPA BPA ABC

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time at the checkout counter and reduces check processing costs. The only apparent drawback: customers lose the week or so "float time" that it normally takes a check to clear. Although shoppers like the system, state banking laws may slow its expansion. For example, banks could face jurisdictional snafus in multi-state metros, such as New York and Washington, DC.

RETAILING

## Forging chains for health gear

Although they exceed $2 billion a year, sales of braces, walkers, and other home health care devices have eluded mass merchandisers and remained in the fragmented hands of 10,000-plus neighborhood dealers. Now at least four contenders—none of them major retailers—are setting up national sales networks. The largest are Abbey Medical (recently acquired by American Hospital Supply) and National Medical Enterprises (a hospital chain) followed by National Medical Care and G. P. Medical Services."

Atlanta-based G. P. Medical typifies how fast all four have grown. The two-year-old subsidiary of Glasrock Medical Services has 73 stores in nine metropolitan areas and accounts for two-thirds of its parent's $45 million in sales. In a field where most dealers wait behind counters, G.P. Medical has 50 salespeople out persuading doctors and hospitals to recommend its products.

Are the four front-runners merely stalking horses for a Sears or K-Mart? G. P. Medical marketing vice president Peter Berrall doesn't equate size with

## S&MM BAROMETER

### Wait 'til (next) Christmas

**There will be little holiday cheer in next month's data on consumer spending as the Federal Reserve's high interest rate policy and worries over jobs and inflation continue to restrain shoppers. What's more, the doleful climate will extend well into the new year. Those are two findings of S&MM's annual poll of leading forecasters, whose combined predictions call for a 1.0% rise in real Gross National Product and a tepid 2.6% increase in consumer outlays (both in 1972$) during 1982.**

**Prospects for the second half are better than the first, however. "The combined effect of an easing in inflation and personal tax cuts will bring the first gains in real household buying power since the early 1970s," says Lawrence Chimerine, president, Chase Econometrics. Adds Data Resources head Otto Eckstein, "The tax cut next July will be worth $32 billion and will be reinforced by Social Security benefits increases."**

**Still, some worries persist. Michael Evans, Evans Economics president, warns that "there can be no recovery unless capital spending picks up, because that's the only offensive weapon left." Carol Brock Kenney, senior economist, Shearson/American Express, frets that "concerns over jobs and balance-sheet losses induced by high interest rates will blunt the positive impetus to spending previously expected from the Oct. 1 tax cut."**

**The 1982 marketing environment**

| Market sector | 1982 | 1981 | % Change 1981–82 | % Change 1980–81 |
|---|---|---|---|---|
| | Bil. of 1972$ | | | |
| Gross National Product | $1,524 | $1,509 | + 1.0% | + 1.0% |
| Personal consumption expenditures | 967 | 952 | + 2.0 | + 2.9 |
| Durables | 147 | 142 | + 3.5 | + 4.4 |
| Nondurables | 374 | 367 | + 1.9 | + 2.5 |
| Services | 466 | 453 | + 2.9 | + 2.7 |
| Capital spending | 161 | 161 | 0.0 | + 1.3 |
| Housing starts (mil. units) | 1.29 | 1.14 | +13.2 | −12.8 |
| New car sales (mil. units) | 8.7 | 8.9 | − 2.2 | − 1.1 |
| Industrial production index (1967 = 100) | 154 | 152 | + 1.3 | + 3.4 |
| Consumer price index (1967 = 100) | 296 | 273 | + 8.4 | +10.5 |

Sources: S&MM estimates, Bache, Chase Econometrics, Data Resources Inc., Economic Analysis Associates, Evans Economics, Goldman Sachs, Manufacturers Hanover Trust Co., Mellon Bank, Merril Lynch Economics, Shearson American Express, A. Gary Shilling & Co.

Sales & Marketing Management

SELLING A SERVICE

# Will used-car buyers nix kicks for pics?

Art lovers aren't rushing to view the exhibit, but Los Angeles has a popular new picture gallery—for used cars. Spurred by the decline in new car sales, entrepreneurs Jill Hall and Rory Ferguson borrowed a British notion designed to free used-car buyers from kicking tires all over the county and allow sellers to drive their cars until a buyer is found.

For $49, a seller gets a color photo of his vehicle hung in Contact-A-Car's storefront gallery and a listing in both the company's computer and a publication distributed to 300 retail stores. Because they list in volume, auto dealers pay only $25 per listing. Buyers are charged only when they want a specific model tracked down ($20).

"We're not interested in junks," says a company spokesperson. "We've found that cars in the $1,000 range are the big movers." And the cars are moving fast: Contact-A-Car sold 300 vehicles in its first three months and plans to open more L.A. locations soon.

PERSONAL COMPUTERS

# Panasonic's little Link

Invasion of the U.S. personal computer market by Japan, Inc., got into full swing last month when Panasonic, Secaucus, NJ, introduced Link, its hand-held computer. The Matsushita subsidiary is expected by industry observers to outrun such early starters as Casio, Sinclair, and Sharp (which also makes Radio Shack's entry) through aggressive marketing and a wide array of peripherals and software.

Underscoring the priority it gives the product, Panasonic created a new marketing division under Richard Lovisolo, general manager, portable electronics, and William Kopp, merchandise manager, hand-held computers. Kopp's biggest challenge: building a distribution network of independent sales organizations, such as systems houses, software suppliers, and computer stores.

With a basic processor priced at $600 and up, Panasonic won't try the consumer market for now, but observers say, it seems bound to make an impact on Hewlett-Packard, Texas Instruments, and other U.S. makers of top-end programmable calculators. Dr. Egil Juliussen of Future Computing, Inc., a Dallas research firm, predicts they will get in the fray because the hand-held's price is competitive and its memory capacity greater.

Kopp's first sales targets are Fortune 1,000 companies, small businesses, schools, and retailers. Because the 14-oz. Link fits in a briefcase and can talk with "host" computers, Kopp has big plans for a special market segment: salespeople.

S&MM'S SEVENTH ANNUAL AWARDS

# Winners on parade

There'll be a new look to S&MM's Seventh Annual Awards Issue, to be published Jan. 18. We will of course announce the top sales and marketing organizations of 1981 and tell our readers how the winners achieved their success. But there will also be a special article profiling outstanding entrepreneurs, and another on the hot new products of the year.

S&MM's editorial staff began tracking companies immediately after last year's winners were chosen. Evaluation began in September. The staff researched candidates in business and industry publications, and interviewed security analysts and other industry observers. They also talked to companies' customers, suppliers, and competitors, as well as to the candidates themselves. Individual editors then presented the results of their research to our board of editors, which makes the final decisions.

You'll find the winners in the Jan. 18 S&MM.

## Sales of personal computers

*Worldwide sales in units*

| | 1981 (000) | 1985 (000) | Annual Growth* |
|---|---|---|---|
| Hand-held | 250 | 2,500 | 78% |
| Desk-top | 650 | 2,000 | 32 |
| Portable | 35 | 600 | 103 |
| Total | 935 | 5,100 | 55% |

*Compound rate
Source: Future Computing, Inc.
Sales & Marketing Management

S&MM SPECIAL REPORT
SALES MARKETING MANAGEMENT

# Marketing Planning

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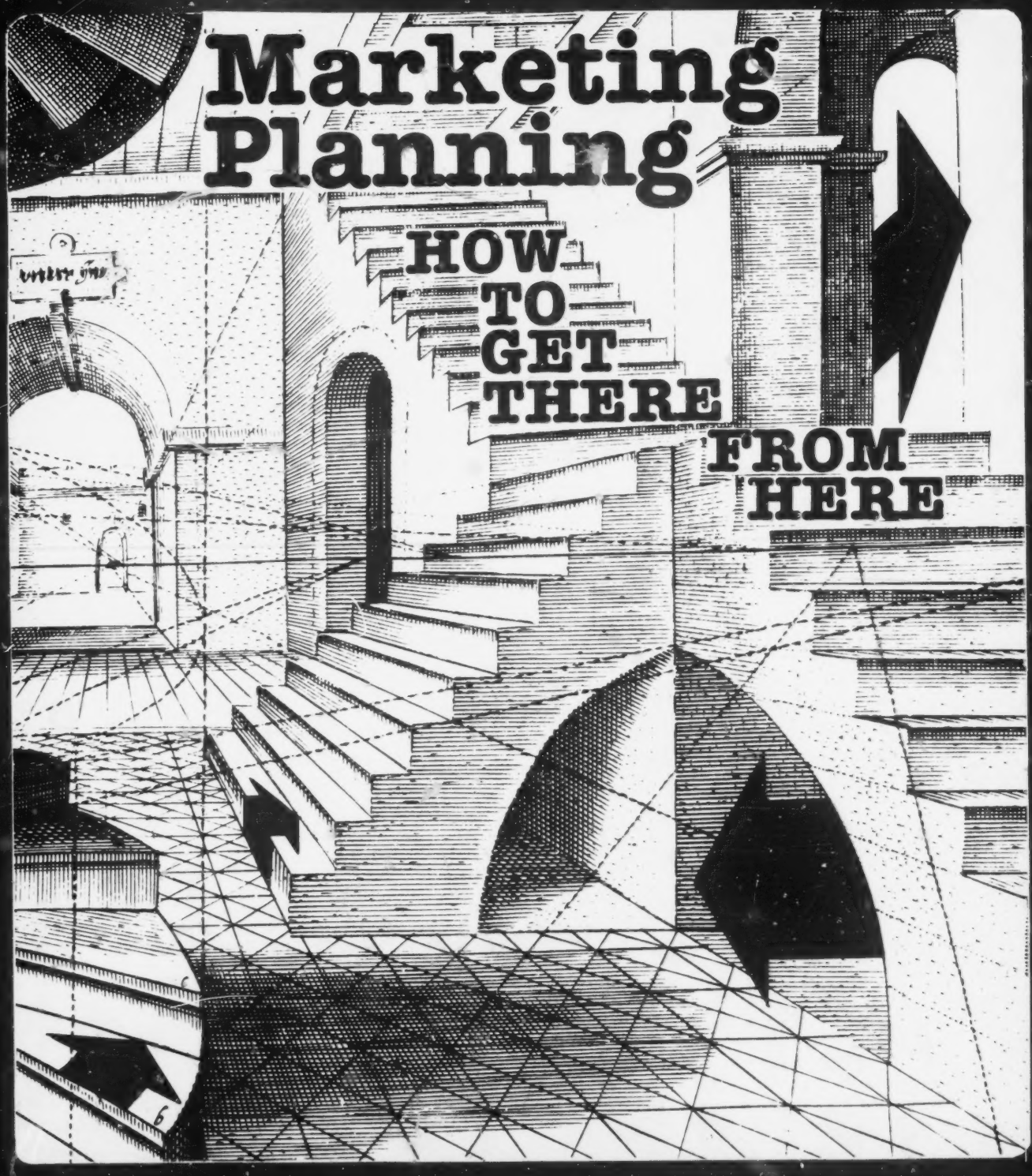

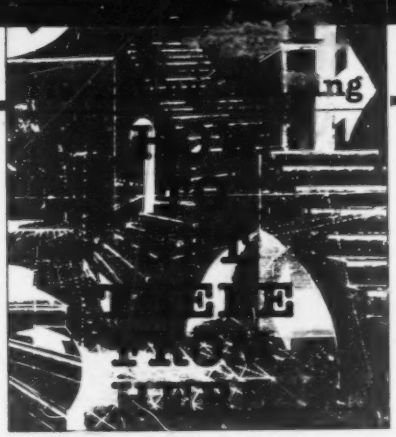

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# Introduction

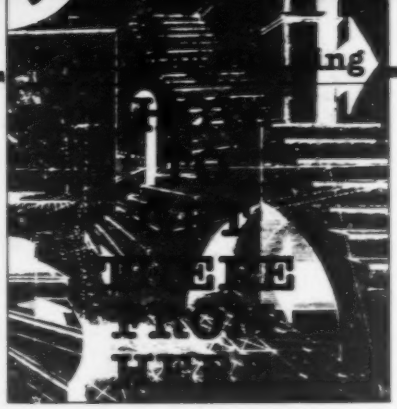
We have rarely seen a time when events seem to catch us by surprise more often than they do today. The federal budget is suddenly in turmoil again, just when we were assured that the beast was being tamed. The economy has taken an unexpected downward turn. Individual industries—petroleum, auto, computer, steel, retailing, to name a few—are in turbulence. Indeed, American business is in the middle of a wave of change, particularly in marketing. Up against odds like these, planning, as the saying goes, is everything.

There is plenty of evidence that marketers are taking that saying to heart. Few today would care to base their marketing planning solely on what the competition is up to or on guesses about what their customers' needs and buying habits might be a few years hence. Instead, as this Special Report will show, marketing planning has come of age.

The savvy planner today has sophisticated methods for tracking market share and for discerning the effects of pricing, advertising, and sales promotions on his future. Now planning often includes the role of the field sales force in reaching marketing goals. There are more controls built into the planning function to allow for reviews and alterations when necessary. Marketing planning is now more often synchronized with corporate planning, especially over the long haul. Naturally, the computer has a hand in all of these things.

So, with far better planning on the part of many marketers (and available to all), why do some of them fail in the marketplace? After all, nobody plans a disaster. Do they?

—THE EDITORS



# Organizing for marketing planning

By RON PAUL
President
Technomic Consultants

Perhaps no management technique has generated as much discussion and activity during the last several years as strategic marketing planning. It was felt that strategic planning was something that belonged only in the large corporation and only in dealing with the global issues of structuring the corporation's "portfolio of businesses" to balance those needing cash and those generating cash.

More recently, however, it has been increasingly recognized that strategic planning is totally adaptable to an individual business unit of a large corporation or, in fact, to any business enterprise, regardless of size and regardless of whether that enterprise is a manufacturer, wholesaler, retailer, trade association or service organization, profit or not for profit.

Strategic marketing planning can be defined simply. It is how the management team specifies and selects the specific marketing actions that are appropriate to achieve the objectives set by the enterprise. The process concentrates on developing and articulating the key methods, "schemes," or concepts that a firm will utilize to employ its resources and advantages in order to out-perform or surpass its competition or, in the case of a new product or process, to exploit an apparent opportunity.

It differs from the annual marketing plan in both focus and detail. The strategic marketing planning process focusses on establishing a long-term direction for the business and in setting longer-term goals rather than focussing on the one-year "numbers" orientation found in the typical annual marketing plan.

Furthermore, the annual marketing plan will tend to detail line-by-line expense budgets and provide considerable tactical information regarding executing, for example, advertising strategies. It may, in fact, include media schedules, trade show plans, and other such details. The strategic planning process is concerned not with the details, but with the rationale behind the actions that might be outlined in the annual marketing plan.

In utilizing the process, careful analysis of the present businesses must be done, and, in addition, all alternatives should be considered. As a result, the strategy team is constantly cognizant of the basic elements present in the marketing mix, such as:

- Product line
- Quality
- Pricing
- Promotion
- Advertising
- Distribution
- Customer service
- Packaging
- Merchandising
- Sales activities.

There is no question that the planning process will naturally bring in other non-sales and marketing aspects and this should be considered as healthy and desirable. Experience shows that the basic thrust provided by the strategic planning process will lead to the natural development of other strategies necessary for the enterprise.

Let's start by stating some up-front conclusions about the Strategic Marketing Planning Process (SMPP).

It's a team report. This is not something that a chief executive officer should engage in privately since to be effective the whole management team must be involved.

It is not time consuming or expensive. Compared to the kinds of time devoted to other management activities, the time required is reasonable. For example, the process we will be outlining probably requires no more than five to eight days of management time in the year the process is introduced. Regarding cost, even if outside consulting is utilized, on an out-of-pocket basis, the cost of implementing the process is not that different from what an organization spends in

*Ron Paul's company, Technomic Consultants, Chicago, compiles S&MM's annual "Survey of Selling Costs."*

Figure 1

***STEP 1:*** **APPOINT COORDINATOR**

***STEP 2:*** **SELECT CONSULTANT IF APPROPRIATE**

***STEP 3:*** **GROUP MEETING I**
**PLANNING MEETING**

1. **Discuss the planning process.**
2. **Discuss/establish/review objectives and goals.**
3. **Initially define and segment present businesses/product categories.**
4. **Discuss the kinds of data needed to evaluate each area (internally and externally).**
5. **Assign responsibility for preparing data for next meeting.**

***STEP 4:*** **DATA DEVELOPMENT**

**MAJOR CATEGORIES**
**EXTERNAL DATA**

1. **Environmental**
2. **Market conditions**
3. **Customers**
4. **Noncustomers**
5. **Channel(s)**
6. **Competitive**

**Consulting and research input may be appropriate**

**MAJOR CATEGORIES**
**INTERNAL DATA**

1. **Financial**
2. **Operating**
3. **Competitive**
4. **Environmental assumptions**
5. **Forecasts**
6. **Organization**

***STEP 5:*** **GROUP MEETING II**
**SITUATION ANALYSIS MEETING**

1. **Agree and refine the segmentation of the present businesses/product categories.**
2. **Review internal and external data, including customer, noncustomer, competitive, financial, and operating data analysis.**
3. **Develop consensus regarding current strengths, limitations, and potential opportunities.**
4. **Initially define, screen, and group alternative strategies which appear feasible for detailed consideration.**
5. **Make assignments to individuals to analyze each strategy prior to next group meeting.**

***STEP 6:*** **STRATEGY ANALYSIS**

***STEP 7:*** **GROUP MEETING III**
**STRATEGIC REVIEW MEETING**

1. **Share results of each analysis performed on each strategy.**
2. **Review financial impact analysis of alternative strategies.**
3. **Develop management consensus regarding attractiveness and desirability of pursuing defined strategies.**
4. **Make refinements as appropriate.**
5. **Assign specific tasks to individuals in order to begin implementation process.**

***STEP 8:*** **FOLLOW-UP ACTIVITIES**

***STEP 9:*** **GROUP MEETING IV**
**REVIEW AND MONITOR SESSION**

1. **Review highlights of previously agreed to strategy.**
2. **Review tasks and action programs agreed to in Group Meeting III.**
3. **Monitor progress toward goals of each individual.**

having an annual accounting audit performed.

Its payback is short term, not just long term. While much of the emphasis in the process will be in developing longer-term objectives and strategies, it can be demonstrated that the end product of the SMPP is the establishment of very specific short-term action steps to be taken by members of the management team. To that extent, it is a logical activity that can provide material to be integrated into the preparation of the annual marketing plan, if one is utilized by the company.

With these truisms behind us, what is the process?

Essentially there are only three questions to be answered:

- ♦ Where do we want to go? Or: goals/objectives/philosophies
- ♦ Where are we now? Or: positions/situations analysis (the marketing or situation audit)
- ♦ How can we get there? Or: Strategy development.

In order to answer these questions, we have outlined a nine-step process shown in Fig. 1. Note that we are recommending a series of group meetings with various members of the management team assigned responsibility for specific activities in the time between the scheduled meetings.

Depending upon the amount of work to be performed between the meetings, the process shown can be accomplished in a three-month period of time, or even less. The process recommended will tend to fit small organizations quite well since it relies more on personal and verbal communications and less on written documentation than the traditional planning process.

Here's a step-by-step method for marketing planning:

**1.** *Appoint a coordinator.* This individual should be selected because of his/her interest and knowledge of the planning process as well as ability to communicate effectively with members of the management team. This individual also plays a key role in providing the written documentation of decisions made during the meetings and

in following through to see that assignments are completed on time and in the right amount of detail.

**2.** *Decide on the use or non-use of consultants.* It has been recognized that the management team *must and should* prepare the plan. On the other hand, consultants often have a role in the process in one of four ways:

- ♦ Guide the planning process
- ♦ Provide external information such as competitive data or market data
- ♦ Challenge particular plans or strategies of the group
- ♦ Be an objective resource for the management team and the chief executive officer during the planning process.

Many organizations have limited the use of consultants to obtaining necessary external data and this may be appropriate if the company is comfortable that the other reasons cited above are not applicable in its case.

**3.** *Schedule Group Meeting I: Planning Meeting.* This first planned meeting is an important one in getting the process launched. In particular, the discussion of objectives and goals is a critical step and one that requires prior thought. This first meeting can in almost all cases be accomplished in less than one full day.

**4.** *Develop the necessary data.* Typically it is well to allow a period of one to two months following the first meeting for the various members of the management team to assemble the data required. Often times market studies may be commissioned during this step to thoroughly evaluate the current businesses that the company is in, to identify critical issues and/or threats present in the markets being served, and to analyze and evaluate major competitors.

**5.** *Schedule Group Meeting II: Situation Analysis Meeting.* This meeting, which may require two days, is an important one in analyzing the company. As a result of the very detailed and thorough analysis in an objective manner of every product, every market, and every competitor, strategy ideas will naturally evolve. The most important end product of the meeting is the consensus regarding strengths, limitations, opportunities, and resources.

Also during this meeting, the first screening and grouping of alternative strategies takes place. Shown below are some examples of the kinds of strategy alternatives to illustrate how succinctly they can be stated.

- ♦ Expand geographically
- ♦ Withdraw from a product category
- ♦ Become a low-cost producer
- ♦ Develop technologically superior products
- ♦ Reduce dependence on few large customers

**6.** *Carefully evaluate and analyze alternative strategies.* After the second group meeting, each individual should be assigned specific tasks relating to one or more of the strategic alternatives. For example, the financial member of the management team will be asked to determine how each strategy impacts on the balance sheet and on the P&L statement.

At the end of the allotted time the planning coordinator should make sure that the analyses are succinctly written and are available for presentation and discussion at Group Meeting III.

**7.** *Conduct Group Meeting III: Strategic Review Meeting.* This meeting is devoted to a review of the strategies that have been under analysis since the last meeting. Prior to this meeting, the coordinator should sit with the chief executive officer and/or the board to make sure that the alternatives being considered are not, for some reason, unfeasible.

At the group meeting it is extremely desirable to reach a consensus regarding the attractiveness of pursuing specifically defined strategies. An important last step of this third meeting is the assignment of specific tasks to individuals in support of the strategies.

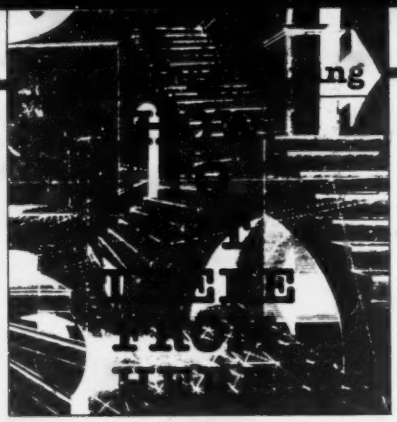
**8.** *Coordinator conducts regular follow-up on activities.* After the third meeting, the important work gets started. A major benefit of the SMPP comes directly from the fact that immediate action in support of longer-term strategies often is initiated and these early activities begin to show benefits during the current operating year. The action steps to be performed should be broken down into small tasks rather than large ones so that a feeling of continual progress is experienced.

**9.** *Conduct Group Meeting IV: Review and Monitor Session.* Six to nine months after Group Meeting III the group should again be brought back to examine the progess that has been made and to make sure that the strategy consensus that was previously developed is still present. If modifications are necessary in either the strategies or the action steps, this meeting will also provide a logical forum for making such changes.

Perhaps the most pressing reason why an organization that hasn't gone through this process should do so is that its competitor either has or is going to do it. Management is learning to think more strategically about its business.

In a larger company it may be mandatory for the marketing group to exercise leadership in the strategic planning area. Otherwise it is possible that a different functional group within the company might tend to direct the planning activities. Given this writer's bias for wanting to take a market and competitive-dominated approach to plans, the dominant thrust of long-range planning should be marketing.

A final thought: The Strategic Marketing Planning Process, which can be recycled as often as conditions warrant, ensures that a marketer continues to think strategically for the long haul, but also has action plans for the short term.



# The dawn of planning at Dana Corp.

By GERALD B. MITCHELL
Chairman
Dana Corp.

1979 was a year that started good and ended bad. The area that was hit the hardest and the quickest was the light-truck market. Dana lost literally hundreds of millions of dollars in sales almost overnight. We were installing new equipment to give us added capacity—equipment that had taken 18 months to 2 years to obtain—when our market disintegrated. We not only didn't need the added capacity, but the capacity we had far exceeded the demand. We had to lay off people and close plants.

This bruising and completely unpleasant experience hastened our re-evaluation of the company and its future.

In December, 1980, we identified eight markets where we had experience, skills, and products. We redefined our three group Tri-Pod to focus on these markets and special niches within them. We had introduced the Tri-Pod concept in 1975; our goal was to divide our sales into three groups: vehicular, industrial, and service, and the Tri-Pod was a way of drawing the attention of our people to the need for a broader base.

We appointed a market strategist for each of these markets. The strategists were operating people at the division level who were given this as an added assignment. They were division presidents, vice presidents, and general managers who had expertise in the markets to which they were assigned. From a marketing standpoint they reported directly to the corporate Policy Committee.

The role of the market strategists was to:

**1.** Define and quantify the assigned market worldwide

**2.** Identify sub-markets and niches

**3.** Identify market opportunities

**4.** Establish market-related goals and objectives for applicable Dana products

**5.** Evaluate technological requirements and protect offerings in relation to market needs and develop appropriate strategy

**6.** Know market-related financial performance

**7.** Maintain worldwide overview of the assigned market

**8.** Review market strategy with the Policy Committee on an annual basis.

It has been a year since we made this change. In that year we have successfully converted our people at all levels and they now talk markets, market niches, and market goals.

We have broken with our tradition. The first 65 years were closely allied with cars, trucks, and Detroit. The next 10 saw some diversification, but we were still product oriented and very heavily dependent upon our traditional markets. Over the next four years we added and emphasized the addition of the industrial market through the Tri-Pod concept. Only in the past year have we identified our eight current markets and begun the big swing in attitudes and actions from a product-centered view of the world to a market view.

To make a change like this this fast, you *must* have an organizational climate that will accept change. We've been working for 10 years to build that climate.

To summarize:

**1.** You must have the conviction that change is necessary, and be committed to making that change. It probably isn't possible to chart a detailed map of where you or your organization want to be in 10 or 20 years. In that period of time you will come to numerous crossroads and a few forks and you must be flexible enough to make decisions that are appropriate at the time.

**2.** You must create a climate for the change. People must accept a reason for the change and be able to adapt to it.

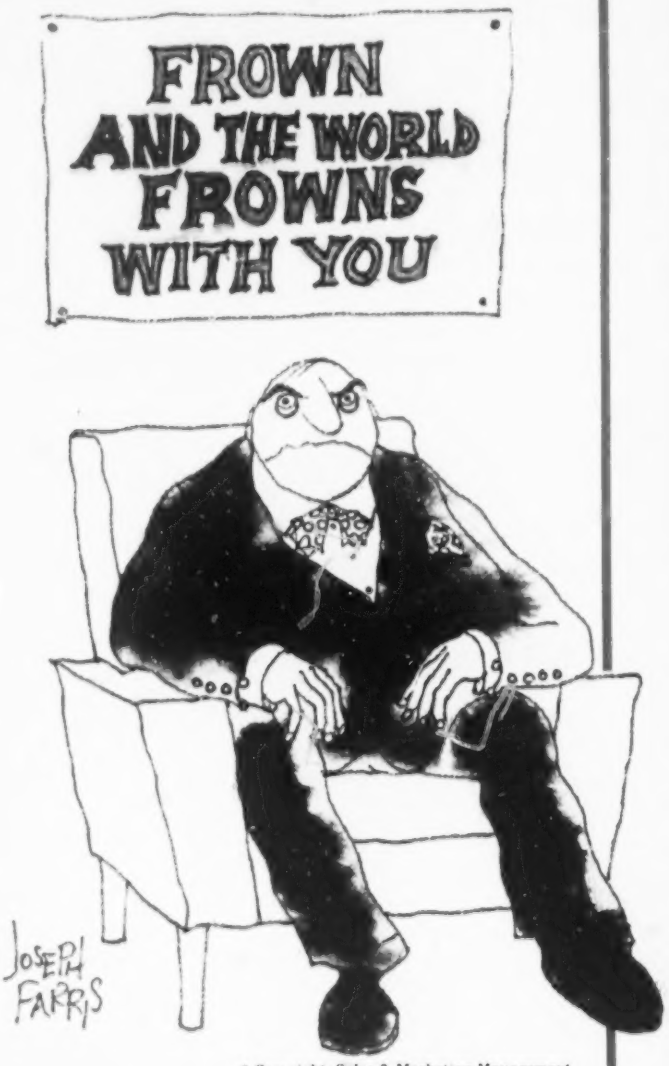
**3.** You must work at the change—you have to get on your soap box and preach to the people. You must sell the program.

*This article is based on an address Gerald Mitchell made at the Conference Board's 1981 Marketing Conference.*

*© The Conference Board, Inc.*

**4.** And finally, if you've done all of the above, you must let your people do their job.

Dana has taken on a new look. We have broadened our base to include much more than the parts for trucks which were so important to us in the past. Our sales mix has dramatically changed. Today General Motors and Ford are each less than 10% of our sales. Our annual distribution and aftermarket sales have increased from $100 million to $1 billion. Our industrial operations are now generating sales of $600 million per year. Our economic environment is changing, and to survive and prosper, Dana must continue to change. Survival means change. Our goal is to position ourselves for success in tomorrow's economic and political climate, whatever that may be.

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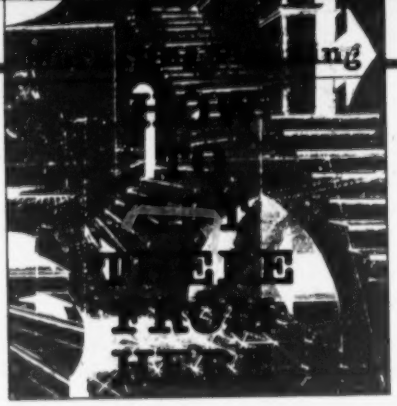
## Why people don't plan

| *Rank order by first choices:* | | *Rank order by combining first and second choices:* | |
|---|---|---|---|
| 1. Too time consuming | 19.15% | 1. Too time consuming | 14.61% |
| 2. Knowledge deficiency | 12.66 | 2. Too much work involved | 12.01 |
| 3. The future is too uncertain | 10.71 | 3. Knowledge deficiency | 11.52 |
| 4. Attitude deficiency | 9.74 | 4. The future is too uncertain | 9.25 |
| 5. Skill deficiency | 7.46 | 5. Skill deficiency | 8.60 |
| 6. Live for today | 6.81 | 6. Attitude deficiency | 8.44 |
| 7. Too much work involved | 6.49 | 7. Don't like or understand process | 5.68 |
| 8. Don't like or understand process | 5.19 | 8. Too difficult | 4.87 |
| 9. Fear of failure | 3.89 | 9. Live for today | 4.87 |
| 10. Man lives by intuition | 3.57 | 10. Fear of failure | 4.22 |
| | 85.71% | | 84.07% |
| All others (9) | 14.29 | All others | 15.93 |
| | 100.00% | | 100.00% |

Excerpted from an article, "Why Managers Resist Planning," by Jack Bologna, president, George Odiorne Associates, Plymouth, MI, which appeared in *Managerial Planning* magazine. Bologna's company surveyed 308 managers; 40% of them said they did not believe in planning, for the reasons given.



AN S&MM SERIES
THE COMPUTER IN MARKETING

# Computers that plan

By THAYER C. TAYLOR
Senior Editor/Management Sciences

William Meserve, senior management consultant, Arthur D. Little, Cambridge, MA, recently told a Conference Board audience: "Managers face two choices—spend more time securing information and analyzing alternatives, or make fewer well-informed decisions. The latter is unacceptable, so managers must have new business information and analytical tools."

His call to action has already been answered, as marketers are making more use of management information systems that wed data bases, computers, and mathematical models into a potent planning aid. The effectiveness of such systems is being enhanced by the development of on-line systems that give the marketer the ability to use the computer directly as well as by syndicated data bases that link the company to the outside world. (Indeed, there is so much data available, or waiting on the horizon, that some planners already talk about an "information overload" that could hamper decision making.)

Says James S. Figura, corporate market research director at Richardson Vicks, Wilton, CT: "Because it can handle large masses of data at electronic speed, the computer gives the marketer more time to reflect, analyze, and identify business opportunities." Adds Joseph P. Thompson, systems management director, Kraft Foods, Chicago: "Where the computer is invaluable to the planner is in its ability to search through massive data bases rapidly, do speedy arithmetic, and give him just what he needs."

The information explosion triggered by the computer can be a boon or bane to the marketer. A boon if, as Van Mayros, senior partner, Infomark Systems Associates, Gainesville, FL, puts it: "He lets the machine do the legwork in manipulating the data for the ongoing quantitative and qualitative analysis that is the heart of the planning." A bane if he lets the torrential tide of printouts swamp him.

Computerized information systems require an extensive learning period. Once the data base is in place—which, most experts agree, should have two to five years of historical data—the marketing planner goes through a learning curve as he builds models that capture the interrelationships between, say, selling time, advertising, and population age groups.

### *Organize the data*

Dr. M.C.A. van Nievelt, director of corporate management services, Nestlé, White Plains, NY, explains: "The first thing is to get the data organized in a way that it can be manipulated. Then the planner starts with simple analyses and gradually works up to progressively more complicated ones. Hopefully, those analyses result in a mathematical model where cause and effect are related to each other. Once he establishes a relationship between an action he took in the marketplace and what occurred as a result, he has a planning tool."

"Using the model," van Nievelt continues, "the marketer can look over his shoulder at history to see what happened in the past that might explain what will happen in the future if he makes certain decisions regarding, for example, sales force size or advertising spending. That's what planning is all about."

Top management can be a guide for model-building starting points. Speaking at the recent Info 81 conference, James M. Mecredy, director of performance research, Holiday Inns, Memphis, TN, advised: "In building an information system, start with what management has been using and improve upon that as you develop more precise information. In time, you learn new ways of developing information and management learns new ways of utilizing the information to make marketing decisions."

Whether their needs are simple or complex, marketers are harnessing the computer in various "subsets" of marketing planning, as the following examples demonstrate:

**The most challenging areas of marketing analysis**

| | |
|---|---|
| Effective trade and consumer promotion | 27% |
| Advertising research and effectiveness evaluation | 26 |
| New product development and evaluation | 20 |
| Long-range competitive forecasting | 14 |
| Pricing impact evaluation | 10 |
| Consumer attitudes and behavior | 9 |
| Influence of economics and lifestyle factors on buying patterns | 7 |

Other areas mentioned:
- Market auditing and competitive analysis
- Integration of market data and consumer test results
- Market and consumer modelling
- Tracking of competition from private labels
- Strategic planning
- Evaluation of local markets

Note: Based on responses from the 58 largest consumer packaged-products firms.
Source: Temple, Barker & Sloane, Inc.
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**Productivity**—Harold E. Chappelear, director of domestic pharmaceutical marketing, Upjohn, Kalamazoo, MI, is tackling the biggest issue confronting marketers: sales force productivity. He's building a series of models that test the relationship between sales force size and productivity as well as the allocation of resources between personal and nonpersonal selling.

After reviewing three-year histories of various sales territories, he created two sets. In one set he split the territories to create new ones, thus enlarging the sales force, and for each of these he matched it with a territory in a control group that has similar characteristics but which is not changed. The two sets will be tracked over a two-year period.

Preliminary results, Chappelear says, indicate that "for the first six months the new territories have a loss in sales. However, as the new salesperson acquires experience the net result is a gain in sales."

A related model aims at discovering where salespeople can be located most effectively. Here, market potential is factored in, along with data on revenue per salesperson and sales coverage by Upjohn and its competitors. "If management gives us approval to hire another 25 salespeople," Chappelear says, "We want to be sure we'll locate the new hires where they'll be most productive."

Other models explore the allocation of resources between personal and nonpersonal selling. This effort measures the impact of changes made in a salesperson's selling time, and in journal advertising, direct mail, scientific symposia, and public relations. "No one can give you a good fix on the values of variations you make in any of these factors," Chappelear says. "We want to get a handle on those variations so that we'll know whether increased selling time or more direct mail will give us a better return on investment."

An important model input is competitor activities. "We have new products coming along that will make us compete with Wyeth Laboratories and Hoffman-La Roche. By analyzing how competitors allocate resources to support certain products, and the results obtained, we'll have a better mix of strategies when we bring out our products," Chappelear says.

The upshot of all this computerized planning, he notes, "is to give us more flexible marketing plans. Before, we adopted a plan and were locked into it, come hell or high water. Now, by sticking closer to the marketplace, and noting from our models when variations in the interrelationships occur, we can make adjustments on the spot."

**Sales strategy**—Jeffrey J. Fox, marketing vice president, Loctite, Newington, CT, relies on computerized planning to rank accounts and prospects according to their revenue potential as well as analyze sales coverage across different account and market sectors (customer industries). His data base includes information on the salesperson's account plan and call reports, enabling his manager to quickly decide if he is concentrating enough on high-potential accounts.

Fox is building a sophisticated computerized matrix of his 11,000 customer base that classifies, on the basis of potential, both accounts and markets on an A-B-C scale. Customers that are "Aa," for example, get the biggest share of salesperson time because both their account and market potential are the highest. Following them, in order, are accounts classified Ab, Ac, Ba, Bb, and so on.

With this computerized structuring, Fox notes, "we can scientifically determine which accounts our salespeople should call on, which ones we can turn over to distributors, and which ones we can solicit with direct mail. Ultimately, we can

overlay this on a map of the U.S. and get a bird's-eye view of where our people are and where they're not and the same for our distributors and business prospects."

Fox sees computer-based planning as having "vast implications for recruiting and staffing a sales force. That's because we'll have better insights on whether we have the right balance of high-level sales calls and high-level accounts, and whether we should stress vertical industry marketing or geographical regional marketing. The basic thing is to give your sales force proper direction, to make sure the sales force is concentrating on the highest payoffs."

**Marketing mix strategy**—Calvert Distillers, New York City, is in the second stage of building a model that will pinpoint the payout periods of selected marketing tactics. The first phase was devoted to scenario-writing, wherein certain assumptions were made about projected expenditures for field selling, advertising, sales promotion, and merchandising. Also, certain local markets were selected where changes in the marketing mix would be made. Assumptions about competitor response to Calvert's stratagems were also built into the model.

In the current phase, the markets will be tracked for two years. Fred G. Ronai, senior national product manager of Lord Calvert Canadian whisky, notes, "it takes that long before you can be sure the model works. Later, we'll analyze the changes that occurred as a result of actions we took and where the extra investments paid off. Once we know more about what level of spending pays off under what conditions we'll be able to translate that strategy to larger parts of the country."

**Advertising strategy**—Before Bell of Pennsylvania, Philadelphia, embarks on a direct mail campaign, Barbara L. Connor, advertising analyst, runs a simulation model that estimates the likely level of profitability. "Based upon the expected return," she says, "we have a better idea of how much to spend or whether we should kill the promotion."

Built two years ago, the model is continuously updated with the results of each campaign. "The inputs must be as current as possible, and reflect prior experience," she notes. "Also, the data must be updated to reflect the higher costs of advertising and product."

The model is used for products sold to both the consumer and industrial markets. Hence, different assumptions are factored in when the campaign is aimed at the residential market or, say, the government-medical market.

Connor reveals that the level of sales-per-dollar of advertising has risen significantly since Bell began using the model. Equally important, she adds, "because it enables us to prioritize our uses of direct mail, we have been saved from spending money that would not have been justified by the payout."

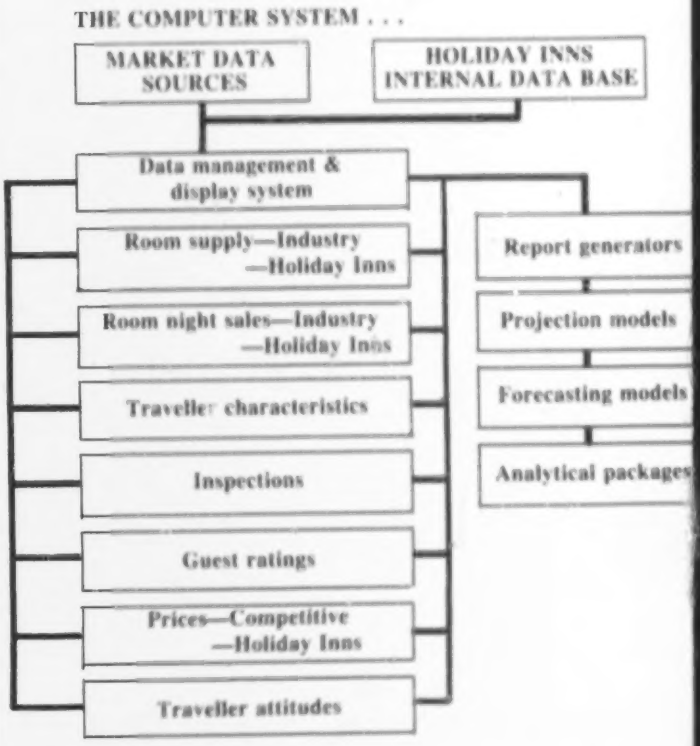
Human judgment plays a vital role in interpreting the model's forecast. "The process doesn't give us a precise dollar figure on the profits we can expect," Connor says. "It provides a range of payouts, giving us greater confidence that there is a certain probability that we'll achieve a given level of profitability."

**New product strategy**—When Barry J. Yelenik, director of marketing services, Worthington Diagnostics, Freehold, NJ, plans promotion strategy for a new product, he sits down at his desktop terminal to work with a data base that has profiles of everyone who has come into contact with his company.

Information on a hospital, for example, will include the types of tests it conducts, the instruments and chemical reagents (both by brand) used in the tests, the number of beds, and the type of hospital (government or private). To help Yelenik qualify the accounts, information on the buying influences indicates the purchasing plans and the level of interest in particular tests, instruments, and reagents.

Recently, Worthington Diagnostics brought out a new instrument that separates chemical compounds by having them migrate at different rates of speed according to their electric properties. Once the decision was made to use direct mail as the media strategy, Yelenik pulled from his data base a list of all accounts that had shown an interest in such an instrument, and analyzed the

**Computerized marketing planning at Holiday Inns**



brands of equipment and reagents the accounts used.

"When the planner knows who is interested in what," Yelenik says, "he is in better position to target his audience as well as style the direct mail for specific audience segements." This precision targeting paid off. "Most direct mail campaigns result in a 2%–3% return," he reveals. "This one did more than ten times better than that."

The decision to use direct mail stemmed from advertising analyses Yelenik can do with his data base. "Because we track all leads that result from our sales promotions," he says, "we can calculate for a product similar to the one we introduced the advertisement's cost-effectiveness. For example, a journal ad that costs $50,000 and produces 100 leads cost us $500 a lead. A $20,000 direct mail campaign generating the same number of leads costs only $100 per lead. On that basis, direct mail is more cost-effective."

The data base's details on competitor brands can also be used for sales force planning, says Melvin D. Platte, president, Impact Systems, Lexington, MA, which designed Yelenik's computer model. "Once you know your 'market share' in each account," he says, "you plan sales call patterns more effectively with your salesperson. While you want him to serve all customers, you also want him to pay special attention to those accounts where a comparison of your own brand and the competition reveals where you have the greatest potential for making inroads or expanding market share."

**Business opportunities**—As marketers become more adept at using computerized information systems, their demands become increasingly sophisticated. A case in point is Holiday Inns.

Initially, simple models for measuring lodging demand nationally and in a few major markets were developed. The company is now building computer systems which combine internal and external data bases in order to have data bases on room supply, room-night sales, traveller characteristics, inspections, guest-ratings, and prices.

"The aim," says James M. Mecredy, director of performance research, "is to develop a history of several reliable market measures which can be combined to measure total lodging demand and provide independent checks on the key variables." Some of the variables: (1) industry supply (rooms available), (2) lodging demand as revealed by consumer tracking studies, and (3) industry occupancy ratios.

Systematic procedures pull the different data sources together (see illustration, shown here). "Folding the data sources together," Mecredy says, "is our key to providing management with a dynamic market information system which can be refined as new data sources become available."

As additional sources are tapped, Mecredy is expanding planning horizons. He is now building

. . . AND THE MARKETING DATA BASE

Terminals

Members of Operating Team

| MARKET PERFORMANCE | INFORMATION NEEDED | DATA SOURCES |
|---|---|---|
| Lodging industry supply | Supply by market | Government |
| Supply characteristics | Downtown-roadside | Industry publications |
| Demand for lodging | Luxury-budget | Competitive directories |
| Demand influencing factors | Sales by market | Traveller surveys |
| | Business vs. pleasure | |
| Holiday Inns overall performance | Downtown-roadside | Holiday Inns system data base |
| Character of Holiday Inns system | Market supply share | Traveller surveys |
| Competitive position | Market demand share | |
| | Demand by traveller segments | |
| Holiday Inns program performance | Guest satisfaction | Guest surveys |
| Product Pricing | Competitive prices | Pricing surveys |
| Advertising | Guest attitudes | Traveller surveys |
| Promotions | Traveller awareness and usage | Inspections |
| | Traveller participation | |

systems on competitive prices, guest ratings of product quality, traveller attitudes, airline passenger miles, and auto travel. This complex mosaic of computerized information, he says, will enable management to plan more effectively in such areas as selecting markets for new hotels, allocating advertising spending geographically, tracking market shares, and setting prices for company-owned properties.

**Trade promotion strategy**—Logistical planning wheels are set in motion at American Can, Greenwich, CT, when a Dixie Cup trade promotion is scheduled. Once the company knows how many retail accounts will participate, and to what extent, Paul D. Birkham, managing director-operational control, has his computers figure out the smoothest, least-cost flow of product from manufacturing to retail store.

"The whole pipeline has to be analyzed," he says, "including the cost of manufacturing, physical movement of merchandise, stocking of chain warehouses, and our own inventory control. It's like a chess game where every piece has to be in place if your strategy is to succeed."

To make sure that all the pieces are in place, the computer generates production schedules for each manufacturing location, plots least-cost distribution from factory to chain warehouse, prepares substitutions if a plant is unable to supply the nearest chain warehouse, and schedules deliveries so that the product will be on store shelves when supporting advertising breaks.

"Because the data must be gathered from several points," Birkham points out, "you need a computer system to put it all together and keep track of what's going on so that people can make intelligent decisions. Invariably, a decision has to be made on alternative courses of action. Having the information available enables people to make such decisions more intelligently."

**Profitability planning**—The feeling that there is a strong correlation between market share and profitability has gained a wide following as a result of work by Strategic Planning Institute (SPI), Cambridge, MA. Based upon information from 2,000 business units, SPI's model, called PIMMS (Profit Impact of Market Strategies), estimates return-on-investment (ROI) for a given business, under given industry and market conditions, following a given strategy.

### *Value of market share*

Mel Applebaum, senior director-management sciences, M&M/Mars, McLean, VA, finds the model helpful when assessing the profitability impact of strategical moves aimed at increasing market share. "No matter what business a company is in," he says, "the model's aggregates show that both market share and product quality are highly related to ROI."

He uses the model to evaluate proposed alternative strategies. "We look at aggregates that have the same characteristics as ours," he says, "such as market share, product quality, and financial parameters. Then we make assumptions of what we plan to do and go back in history and see what happened to the aggregates under similar circumstances. You get a pretty good idea, relative to the data base, about whether your planned moves are good or bad ideas."

Two trends promise to make the computer even more widely used in marketing planning—on-line systems and syndicated data bases. The on-line systems, which give the marketer direct access to the computer, provide speedy answers to his "need to know." Outside date bases, with models of the external world, give the marketer a perspective on the demographic and socioeconomic factors that will affect his strategies.

The growing popularity of on-line systems is linked by Diebold Group's vice president Michael Weiner to "the trend to make information more accessible to, and easier to manipulate by, the end-user. When a marketer asks a 'what-if' question, he usually must have the answer right away."

### *Trial and error*

Equally important is the learning process that takes place. "Questions are not always formulated correctly the first time around," Nestlé's van Nievelt points out. "The answer that comes back suggests another question, and this trial-and-error process goes on until the marketer hits upon the real question he had in mind."

Because marketing planning embraces the total environment in which marketers compete, information on the external world is being married to internal data on shipments, advertising, and so on. External-type information ranges from record-keeping data that tracks a product after it leaves the shipping dock to elaborate economic models.

A survey by Temple, Barker & Sloane, Lexington, MA, underscores marketers' demand for data. According to Timothy A. Davidson, consultant, a survey of 58 big consumer packaged-products firms found "two-thirds using both A. C. Nielsen for in-store movement and SAMI (Selling Areas Marketing) for warehouse withdrawals. The most popular consumer diary panel was NPD Research, with 25% using it. One-quarter use Majers to track newspaper and coupon promotions."

Planners opting for detailed models of the overall environment can select from a menu offered by Data Resources, Lexington, MA a McGraw-Hill subsidiary. A demographic forecasting model, for example, projects future population changes for age, sex, occupation, income, and family size. These changes are linked to the consequences of expected economic trends, such as a recession's different impacts on lower and upper-income groups. Another part of the model uses consumer panel diary information to develop user penetration among different population segments.

"A marketer can apply the model's forecast to

## Types of marketing analysis done by large companies

MARKET SHARE TRACKING (General) 93%
Tracking market share using syndicated service data 84%
Comprehensive market share tracking 75%
Competitive price/promotion/advertising analysis 64%
PRICE, PROMOTION, AND ADVERTISING (General) 92%
Promotional impact 70%
Advertising effectiveness 70%
Price sensitivity 62%
DEMOGRAPHIC ANALYSIS 87%
FACTORY SHIPMENTS (General) 81%
Current period vs. prior 67%
Actual vs. planned 61%
Regional shipments tracking 58%
Customer level shipments 50%
SHORT-TERM SALES FORECASTING 76%
PSYCHOGRAPHIC ANALYSIS 62%

Note: Based on responses from the 58 largest consumer packaged-products firms.
Source: Temple, Barker & Sloane, Inc.
Sales & Marketing Management.

his product," says Nathaniel Welch, marketing director, consumer research division, "and get an estimate of his total market potential as a result of the anticipated changes. Information on the expected changes puts him in a better position to plan marketing strategies that will be in alignment with target markets."

Welch notes that clients are showing more interest in developing pricing strategies that are related to productivity and profitability goals. DRI has built a Resource Allocation of Strategies model whose main inputs are a company's use of labor, capital, and materials (which includes equipment). The model measures how efficient the company is at turning each of the three resources into output and combines this with pricing information.

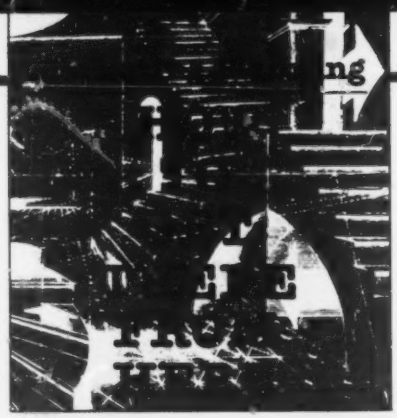
"The objective is to determine whether prices realistically reflect the most productive use of the three components," says Welch.

Industrial marketers, too, can tap data bases oriented to their special needs. A typical vendor is Economic Information Systems (EIS), New York City, which supplies the manufacturing data for *Sales & Marketing Management's* annual *Survey of Industrial Purchasing Power.*

Two data bases are maintained by EIS. One contains information, including sales volume, on 500,000 business establishments with 20 or more employees. A second one, using input-output analysis, shows what individual industries sell to, and buy from, each other, and traces this to the establishment level.

Thomas W. White, director of marketing consulting, Rexnord, Inc., Milwaukee, WI, notes that "what sets EIS apart from other data base suppliers is that their shipments figures help you identify the value of prospective customers as well as relate one customer to another in terms of your product potential. If you go by the 80–20 rule—that 80% of your business comes from 20% of your customers—the EIS data provides a valuable pointer on which 20% you want to go after."

As on-line systems make it increasingly easier for the marketer to use computers, and syndicated data bases offer him more customized information, marketing planning will take on a new orientation. The function will be pushed further down in the organization and out into the field so that, eventually, territory managers will do their own market planning. Ultimately, it will be—everyone a planner.



# How to discover what your salespeople are planning (and doing)

By JAMES P. ALAMPI
Vice President, International Group
VWR Scientific, Inc.

All praise to salespeople, but dare you trust their forecasts to be (1) accurate in their overall numbers and (2) in tune with your objectives, especially profitability?

One method of analyzing the forecast increase in sales and gross margin in a sales representative's territory is to break down the planned gross margin increase into its contributing factors to be sure that profitability is not being sacrificed for raw sales increases. Figure 1 is a simple table to enable analysis of forecast gross margin increases by contributing factors.

The first requirement, of course, is to estimate what the final year-end sales and gross margin will be:

| | |
|---|---|
| Estimated 1981 final sales | $100,000 |
| Estimated 1981 gross margin | 25,000 |
| Estimated 1981 G.M. % | 25.0% |

$$\text{(Where G.M. \%} = \frac{\text{Gross Margin)}}{\text{Sales}}$$

The next step is to forecast for the coming year:

| | |
|---|---|
| Forecast 1982 sales | $120,000 |
| Forecast 1982 gross margin | 28,000 |
| Forecast 1982 G.M. % | 23.3% |

With these six numbers, it is possible to determine where the forecast increase in a territory's gross margin will come from.

Simplistically, the three primary factors which influence gross margin dollar production are price increases, changes in the gross margin percentage, and changes in the volume of goods sold. Price changes can be factored using economic and management forecasts for the overall impact of price changes during the coming year; thus, if management feels prices will increase 10% during the coming year, if exactly the same number of products in the same mix is sold in 1982 as in 1981, sales and gross margin dollars should be approximately 10% higher.

Gross margin increases can come as a result of selling more high profit products (changing the mix), or reducing discounts on the products currently being sold. In this case, an assumption is made (for comparison) that if the 1982 sales forecast was at the 1981 gross margin level, there would be increased gross margin due to the increase in sales dollars.

Volume changes are calculated to be the sole remaining influence by subtracting the changes from price increases and gross margin percentage increases from the total forecast gross margin increase.

First, calculate the total sales and gross margin increases:

**Total Forecast Sales Increase = 1982 Forecast Sales − Estimated 1981 Final Sales**
**$120,000 − $100,000 = $20,000**

**Total Forecast Gross Margin Increase = 1982 Forecast Gross Margin − Estimated 1981 Final Gross Margin**
**$28,000 − $25,000 = $3,000**

*James Alampi is a former district manager at VWR Scientific, Inc. In 1979, he was the top winner of S&MM's Survey of Buying Power Contest, in which "Survey" users were asked to describe how they use its marketing data in their businesses.*

Figure 1

| *Factors affecting Gross Margin increase/decrease* | *Amount of increase/decrease in:* (1) *Sales $* | (2) *G.M. $* | *% of Total Gross Margin change due to:* |
|---|---|---|---|
| **Price changes** | | | |
| **Gross margin % changes** | | | |
| **Volume changes** | | | |
| **Total change** | | | |

**Estimated current year final:**
**Sales $**
**Gross margin $**
**G.M. %**

**Forecast:**
**Sales $**
**Gross margin $**
**G.M. %**

and insert in the appropriate column on the "Total change" line in Figure 1.

Next, projecting 10% price increases, calculate what the 1982 sales and gross margin increase would be with no other influencing factors:

**Estimated 1981 final sales**
**$100,000 × 10% = $10,000**
**Estimated 1981 final gross margin**
**$25,000 × 10% = $2,500**

and insert in the appropriate column on the "Price changes" line. The third column is merely $2,500 divided by the total gross margin change ($3,000) or 83.3%.

Calculate the influence from any change in the G.M. %:

**Forecast 1982 Gross Margin − (Forecast 1982 Sales at Estimated 1981 Final G.M. %)**
**$28,000 − ($120,000 × 25.0%)**
**$28,000 − $30,000 = ($2,000)**

The impact of reducing the gross margin percentage from 25.0% in 1981 to 23.3% in 1982 will be a net *decrease* of $2,000 G.M. dollars. Insert in the appropriate column in the "Gross margin % change" line. Again the third column is ($2,000) divided by the total gross margin change ($3,000) or (66.7%).

Finally, subtract the price change and gross margin percentage change line numbers from the totals to derive the volume change line. A completed table, using the sales and other figures from the example just given, is shown at the top of the next column.

| | *Amount of increase (decrease) in:* (1) *Sales $* | (2) *G.M. $* | *% of Total G.M. change due to:* |
|---|---|---|---|
| **Price changes (10%)** | **$10,000** | **$2,500** | **83.3** |
| **Gross margin % changes** | **−2,000** | **−2,000** | **−66.7** |
| **Volume changes** | **12,000** | **2,500** | **83.3** |
| **Total change** | **$20,000** | **$3,000** | **100.0** |

Thus even with a forecast $20,000 (20%) increase in sales, the overall forecast gross margin increase is only $3,000; $2,500 (83.3%) from price increases, $2,500 (83.3%) from increased volume of products, and erosion of the G.M.% from 25.0% to 23.3% actually *decreases* the overall gross margin by $2,000 (66.7%).

In the next example, a different situation exists:

| | |
|---|---|
| **Estimated 1981 final sales** | **= $200,000** |
| **Estimated 1981 gross margin** | **= $ 48,000** |
| **Estimated 1981 G.M. %** | **= 24.0%** |
| **Forecast 1982 sales** | **= $225,000** |
| **Forecast 1982 gross margin** | **= $ 56,250** |
| **Forecast 1982 G.M. %** | **= 25.0%** |

| | *Amount of increase (decrease) in:* (1) *Sales $* | (2) *G.M. $* | *% of Total G.M. change due to:* |
|---|---|---|---|
| **Price changes (10%)** | **$20,000** | **$4,800** | **58.2%** |
| **G.M.% changes** | **2,250** | **2,250** | **27.3%** |
| **Volume changes** | **2,750** | **1,200** | **14.5%** |
| **Total change** | **$25,000** | **$8,250** | **100.0%** |

Here, the forecast $25,000 sales increase will produce a forecast $8,250 increase in gross

margin; of the $8,250, $4,800 (58.2%) comes from price increases, $2,250 (27.3%) from a higher gross margin percentage, and only $1,200 (14.5%) from real increases in volume. In this case, while desirable increases in gross margin have occurred, there may be an unacceptable loss of market share, since little of the increase will come from increased unit volume.

### *The value of analyzing*

A closer examination and analysis may reveal some interesting statistics and problems. Since real growth will contribute less to the gross margin increase than the increase in the gross margin percentage, it may be that this sales representative is planning to concentrate on only historically high profit product lines in the more profitable small accounts, to the exclusion of products selected by management for increased penetration and market share during the coming year.

If this is the case, it would then be appropriate for the sales manager conducting this forecast review to redirect this sales representative's personal marketing plan to lessen the gross margin percentage increase, and increase the real growth. Substituting a forecast 1982 gross margin percentage of 24.5% (for the original 25.0%) might allow the forecast 1982 sales to be higher, and then the entire picture changes:

| | |
|---|---|
| Estimated 1981 final sales | = $200,000 |
| Estimated 1981 final gross margin | = $ 48,000 |
| Estimated 1981 final G.M. % | = 24.0% |
| Forecast 1982 sales | = $235,000 |
| Forecast 1982 gross margin | = $ 57,575 |
| Forecast 1982 G.M. % | = 24.5% |

The new table would become:

| | *Amount of increase (decrease) in:* (1) Sales $ | (2) G.M. $ | *% of Total G.M. change due to:* |
|---|---|---|---|
| Price changes (@10%) | $20,000 | $4,800 | 50.1% |
| Gross margin % changes | 1,175 | 1,175 | 12.3% |
| Volume changes | 13,825 | 3,600 | 37.6% |
| Total change | 35,000 | 9,575 | 100.0% |

This may be more acceptable and consistent with management programs since gross margin percentage is improved by half a percentage point (thereby contributing 12.3% of the total forecast gross margin increase), while at the same time, real growth will contribute 37.6% of the gross margin increase (while obviously putting more units in front of the customer, increasing penetration, share, awareness, etc.).

The overall impact of these well-balanced factors reveals a 17.5% forecast increase in sales ($200,000 to $235,000) with a 19.9% forecast increase in gross margin ($48,000 to $57,575). Additionally, the desirable gross margin increase will not be dependent only on "selling at a higher profit," but will be dependent on all three factors that will be part of the territory marketing plan.

The bottom line, of course, is to achieve a good balance between (1) the influencing factors that are commensurate with the goals of the company and (2) the resources available. A frank discussion of this type of analysis during individual forecasting meetings can be enlightening to both sales personnel and management, and may result in increased awareness of the factors and costs of sales growth on everyone's part.

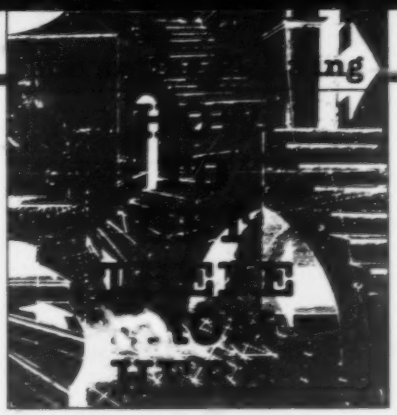
## At Com Systems, they bank on the future

**As we say, the president plans to lay off a little of his stock as part of the offering. He will get at least $6 a share for his stock for which he (as did other insiders for theirs) paid a whole half a cent a share.**

**What really sets t' rospectus apart, however, is a little item listed on page 33 under "Current Liabilities." It reads in full: "Checks drawn against future deposits . . . $86,434."**

**At the very least, that shows a touching belief in the future on the part of Com Systems. And what an understanding bank.**

From Alan Abelson's "Up & Down Wall Street" column in the Nov. 2, 1981 *Barron's*, in which he reports on the present and future of Com Systems, a Van Nuys, CA, marketer of telephone and other communications products.



# How they monitor planning at Greer Hydraulics

By LIZ MURPHY
West Coast Editor

He doesn't wear burnished stars on his shoulders but Tom Yormick, marketing director for Greer Hydraulics, City of Commerce, CA, likens his job to that of a general. He has drawn up his battle plans for the next five years but, as in real war, the unexpected has to be anticipated.

"I have very detailed, very dynamic, planning, but I don't have a crystal ball," Yormick says. "I can't tell you what's going to happen with Congress. I can't tell you what the Administration is going to do. I can tell you what they say they are going to do, but I can't say that that's what will happen so I have to have contingency planning.

"It's almost like a war game in business. You're in the ready room, the war room, making your plans, mapping out the company's growth, short term, long term, two years, five years, and you're hoping it will all work out."

Yormick is basing his hope on a just completed, two-in.-thick strategy plan that he spearheaded for his company under the guidance of A.T. Carney, a Chicago business consultant firm.

"Our strategic planning process started about two and a half years ago. A.T. Carney acted as coach, guiding the upper management of Greer Hydraulics and our parent company, Voi-Shan Industries. It guided us to the best system for short-term and long-range planning."

What Greer Hydraulics settled on was P.I.M.S., Profit Impact on Marketing Strategy, a marketing strategy developed 22 years ago by General Electric's advanced business planners. "It took about six months of intensive meetings with Carney to get through the mechanics of understanding the system. Our first goal was a three-year plan, looking at a base year for information purposes. Now we're restudying a five-year strategic plan that we've just completed. The plan is long-range, but it's also very dynamic. It can change at six-month intervals or it can change on a weekly basis, depending upon business and economic conditions." Yormick admits that, although the plan is only 65 days old, it could change by as much as 25%.

Greer Hydraulics, which manufactures and markets precision controls, surge controls, and energy-sparing devices, has eight marketing areas which are pinpointed in Yormick's strategic plan.

"We know how much of the market share of each of our segments we have today and we know where we want to be in five years. I'm not at liberty to say what our market share is in each of our markets but of our three primary markets, in at least two of them, we have a substantial market share, better than 50%." Greer Hydraulics' three major markets are the petroleum, industrial flow, and mobile industries.

### *Not by marketing alone*

Achieving a marketing objective cannot be done by marketing alone, so Greer Hydraulics' strategic planning covers all areas of the company's operations: design, manufacturing, engineering, finance, gross finance, profits and gross profits, and, of course, marketing.

Yormick says, "To make the plan work is going to take an awful lot of work on our part in resource planning and developing, both human and plant."

"We want a greater market, a greater share. How are we going to do that? How are we going to make it happen? Are we going to develop six or eight new products over the next five years? Have we the human resources to do that? Are we going to clone Tom Yormick six times to accomplish this or are we going to hire other people? The plan tells us exactly what resources are going to be required."

Greer Hydraulics considers its "sphere of influence" to be North America, including Mexico, Canada, and an emerging South American mar-

"WHAT ARE YOU GOING TO DO ABOUT THE RAIN?"

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ket. The company also has licensees in Europe and Japan.

"When we built this five-year strategy plan it took us four months after our initial six months of learning to understand the mechanics of it. Probably 75% of my time and a lot of other people's time was directed toward this project. It was spearheaded by marketing because it addresses gaining market share and improving the profits of the company.

"We look at growth rate very closely in our study. I could tell you by each Product Marketing Segment, what our 1981 sales are forecast at and what we anticipate, plan, and forecast for sales for 1986 and how to change the mix of individual PMSs for increased sales. In certain PMSs, we have 100% capacity. In others we have a percentage of that capacity. Today we have a certain mix. In 1986 the mix is going to change."

Yormick believes that the mixed product nature of his company, and the way the plan was devised, make the plan workable. "The plan is based on certain assumptions—you must have assumptions if you're going to plan. We make these assumptions and we try to base them on the best information available. Without certain economic and political assumptions, the plan is worthless. If they change, the plan changes.

"In the type of business we're in, there are many, many factors that impact on us. Some of them we do control and some of them we do not control. If the interest rate were to drop four points tomorrow, we don't control that but it would certainly impact our business tremendously.

"If you're in the petroleum business, OPEC is an impact, as is U.S. government policy on energy, so we address each one of these issues in our plan. We ask ourselves, What can affect the market either positively or negatively? What can we do to optimize the opportunities? What can we do to counter the threats? And we try to anticipate what responses these factors will evoke in our competitors. We then try to figure out a response to *their* thrust to overcome *our* strategy."

Yormick considers the company's mix as crucial to the strategy plan's success. "We're fortunate that we're not tied to any one single industry. The energy marketplace is a far cry from the mobile marketplace, so, hopefully, one is up when one is down."

Yormick points out that the market can be forced. "A company can actually take a stagnant market and impact the market to make it grow. Let's look at the mobile market, which breaks down into several areas, agriculture, material handling, construction and mining equipment, over-the-road vehicles, trucks, and automobiles. The market growth of the mobile area we're looking at right now is fantastic. We can impact that market by introducing innovative products with new applications that haven't even been looked at before by that market, to save fuel, conserve energy, double and triple redundancy of safety in vehicles. If we do this it's going to make that market really grow."

Despite all the variables Yormick has confidence in the success of his plan. "These are very quantitative goals that are measurable. There are timetables. Some of our goals are extremely optimistic and have to be revised from time to time. We occasionally get very bullish and set unrealistic goals, but we have a dynamic plan. It can be revised and we do revise it. If things are a little too bullish then we bring them in or extend them out, and some of our goals we accomplish in half the time we thought we would," Yormick says.

"There's no guarantee that everything's going to come to pass. If everything happens in the five-year plan it will be the first time ever in the history of man that that has happened. The plan has been written on all the 'givens,' all the assumptions, and all the things that can impact it, the business situation, the political situation, the economic situation. Things change and the plan

# JAUNDICED EYE

## Ah, to have a plan, now that decision time is here

A hundred years ago, when I was in the advertising agency business, most of my clients were small and were first-time advertisers. I sold them on using the services of my agency because I offered marketing counsel as an integral part of effective advertising.

"First, we must know your marketing objectives," I told a brand-new client who manufactured athletic shoes.

"I thought that's what you were going to tell me, Jim," he said, as he hesitated signing my contract.

"Well, sure, Mike," I assured him, " but naturally I'm going to have to get your input. After all, you know why you went into this business and obviously you know more about the shoe business than I do. I know about marketing."

"O.K.," he said, leaning back in his swivel chair. "To give you a start, I went into the shoe business to make money. Does that help you?"

I smiled patiently. He didn't.

"How many pairs of shoes do you want to sell? We call that *sales forecasting*," I said.

"All I can make," he replied without hesitation. Because he was quite positive on that point, I felt I had a start.

"How many pairs is that?"

"Ten thousand gross."

"How many are you making now?"

"Two thousand gross."

"Do you have the plant capacity for the 10,000?"

"No." he said. "I'd have to get another plant or two."

"What about quality? How do you see your product quality-wise against the competition? We call that *product positioning* in the advertising business. But if I'm getting too technical, just say so." I poised my pencil for his answer.

"Best value," he replied.

"I see," I said and nodded knowingly, not having the remotest idea what to write on my note pad. I continued with the plan.

"What's the market?"

"The United States and overseas."

"Yes, but that's *where*. What about *who*?"

"Athletes!" he said. Because he was clearly becoming impatient, I decided to speed things up.

"What about seasons of the year? You know, different sports during different seasons?"

He put down the pen—without having signed the contract.

"Maybe baseball shoes in the spring, football shoes in the fall, and, maybe, just maybe, ski boots in the winter. Tell me, Jim, am I going too fast for you? I notice you're not taking notes anymore."

"No," I assured him with a confident smile. "I think I have enough here. Let me go back to my office, noodle this information around with our marketing people, and get back to you with a written plan."

Back at the office I met with our Marketing Plans Board. It was a short meeting.

"Jim, I think *you* need a marketing plan describing the kind of *clients* we want," the chairman of the Plans Board told me.

"What kind of clients *do* we want?" I asked, dejected.

"All we can get!" he shouted at me.

"How big?" I got out my note pad again.

"*Very* big," was his answer.

"Where's the market?" I asked, dreading the answer.

"The United States and overseas."

"Isn't that a little vague?" I wanted to know.

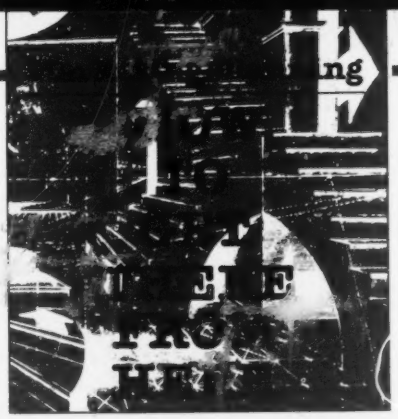
"Jim," he said with a tight smile, "you're getting the message."

*By Jim Lavenson*

changes with it. Certain market areas have changed in the last 60 days which means that we have to change strategies."

He adds, "Many large companies hire a vice president of strategic planning, and he has a staff anywhere from two to eight people. They address the company's strategic plan daily. In a medium-size company such as Greer Hydraulics, we just cannot afford that luxury. So we do it with a consultant twice a year, once a year comprehensively, which takes, as the plan is now written, three to four weeks of evaluation. Every six months we spend two to three days evaluating and changing as necessary."

It's necessary insurance, Yormick says. "We misread U.S. energy policies two years ago, as well as the reaction to certain OPEC moves. We were too conservative in one area and bullish in another. Fortunately it was an error we could recover from fairly easily. Did it cost the company money? Yes. A lot of money? No. Had we read the situation correctly, our marketing situation would have been in better condition sooner. We do make errors."



Marketing planning produces long-term goals; the marketing plan, usually written for a one-year period only, is a specific guide for eventually attaining those goals. For companies that do not do strategic marketing planning, it may be the only blueprint available. Here, in an excerpt from his book, *How to Prepare and Use Marketing Plans for Profits*, H.W. Goetsch, president, Marketing For Profit, Inc., provides the questions you'll need to answer in creating a marketing plan. To order copies of the Goetsch book, see the Bibliography.

# Planning the marketing plan

## I. COMMITMENT PHASE

**1.** Is the chief executive committed to marketing planning, and is planning ingrained with all top executives in the organization?
**2.** Are plans prepared with participation of key functional managers, or are they dictated?
**3.** Do we really implement a marketing plan, measure its performance against the plan, and adjust for deviation or necessary changes?
**4.** Do we have a coordinated marketing program or an isolated sales department?
**5.** Are we letting budgets replace management decisions?
**6.** Do our marketing managers understand and use our computer capabilities and are we using modern tools—computers and marketing research?
**7.** Are all marketing functions under the direction of one top-level executive?

## II. AUDIT PHASE

*MARKETS—Analyze where products are sold*
**1.** What is the market size?
**2.** How is it segmented?
**3.** How are sales currently segmented?
**4.** Should different segments be developed?
**5.** What is our response to geographic trends?

*SALES HISTORY—Analyze previous results*
**1.** How do sales break down within the product or service?
**2.** Are growth and profit trends reflected?
**3.** Which territories do not yield potential?
**4.** Are there abnormal cycles or seasonalities?
**5.** Do sales match previous forecasts?

*PRODUCTS—Objectively appraise the product*
**1.** Is the product or service free from deadwood?
**2.** What is the effect of user demands or trends?
**3.** Are packaging and branding acceptable?
**4.** Are there features or benefits to exploit?
**5.** Where are the voids?
**6.** Does this plan period include new product introductions?
**7.** Is the level of customer service adequate?
**8.** How is the product viewed by customers?

*CUSTOMER—Precisely identify the customer*
**1.** What is the profile of present and potential user (age, sex, income, attitudes, education, occupation, and lifestyle)?
**2.** Are customers younger or older, on the average, than those of our competitors?
**3.** Are there geographic aspects and changes?
**4.** What is the frequency and quantity of customer use?
**5.** Why do people purchase the product/service and what motivates their choice?
**6.** Who makes buying decisions?

*COMPETITION—Identify their influence*
**1.** Who are the principal competitors?
**2.** What are their market shares?
**3.** Where do they seem to be headed?
**4.** What are their strengths and weaknesses?
**5.** Is the field easily entered?
**6.** Is the market dominated?

*PRICING—Study product pricing for growth and profitability*
**1.** What are the objectives of current policy?
**2.** Are price limitations inherent in the product or marketplace?
**3.** Does price compare with competition in similar levels of quality?
**4.** Is the price list understandable and current?
**5.** How are prices set?
**6.** Does internal cost information show profitability of each product?

*SELLING CHANNELS—Identify strength and weakness in the mode used to reach customers*
**1.** Does the system offer best access to target markets?
**2.** What are sales objectives for those markets?
**3.** Is performance measured against potential?
**4.** Do product characteristics require special channels?
**5.** Are selling expenses proportionate to results

and potentials within markets and territories?
6. What are the deficiencies in selection, training, performance, motivation or compensation?
7. Is there objective control of selling activity?

*DELIVERY AND INVENTORY—Evaluate physical performance*
1. Are adequate inventories kept in the right mix?
2. Is inventory turnover acceptable?
3. Do orders receive efficient processing?
4. Are shipping schedules and promises kept?
5. How does performance compare with competition?
6. Are forecasts for production planning acceptable?

*ADVERTISING—Critically examine media's effectiveness*
1. What are the objectives of the program?
2. Is advertising coordinated with the marketing plan?
3. How is effectiveness measured?
4. Is the agency's effectiveness objectively measured?
5. How is advertising integrated with promotion and selling?
6. What are the criteria for agency selection?

*PROMOTION—Audit activities designed to induce sales*
1. Does the promotion support a marketing objective?
2. Was it carefully budgeted?
3. Is it integrated with personal selling and advertising?
4. How is it measured for results?

## III. PLAN PHASE

*DEFINE ASSUMPTIONS—Estimate environmental factors*
1. What are the probable economic conditions?
2. Will there be new technology or competition?
3. How will governmental or regulatory agencies affect the plan?
4. Can competitive innovations be anticipated?
5. Are customer or market changes perceived?
6. Do capabilities (capital, people, facilities, selling channels) exist to achieve the goals?

*SET GOALS—Expressed in quantitative terms, state the end sales and profit result to be achieved during the plan period*
1. Is the goal expressed as a sales and profit target?
2. Does it represent realistic attainment, neither too high nor too low?
3. Has there been participation in structuring the goal?

*ESTABLISH OBJECTIVES—Quantify results necessary for sales goal achievement*
1. Does the objective correct weakness, utilize strength or exploit opportunity?
2. Is it specific?
3. Can it be accomplished in the plan period?
4. Will it be consistent with the best interests of the company?
5. Is it compatible with all other objectives?

*DETERMINE STRATEGIES—Blend all elements of the marketing mix into action plans to achieve planning objectives*
1. Is strategy consistent with objectives?
2. Does it respond to the current marketing environment?
3. Are necessary resources available?
4. What is the time frame for accomplishment?
5. Is there a high-risk factor which could jeopardize objectives?
6. Were alternate strategies considered?

## IV. IMPLEMENT PHASE

*ASSIGN TASKS—Formulate programs fulfilling strategies*
1. Is the task properly assigned?
2. Was it understood?
3. Are tasks given priority according to urgency?
4. Were completion deadlines established?

*DEVELOP SALES FORECASTS—Convert the sales goal into production and service estimates*
1. Are cyclical/seasonal patterns changing?
2. Does the economic climate differ from beginning appraisals?
3. Have irregular differences occurred (special promotions, price changes, unexpected competition, work stoppage) to alter the forecast?

*SET PLANS AND QUOTAS—Allocate proportional units of the forecast*
1. Is it realistic with respect to territory or market potential?
2. Does it match the recipient's potential?
3. How does it compare with past performance?
4. Can it be supported with necessary resources?
5. Does it convey all elements of the strategy?
6. Is it prepared and communicated before the plan period starts?

*PREPARE THE BUDGETS—Quantify expenditures required to achieve the goal*
1. Does the potential profit support the request?
2. Can the same result be achieved without additional funds?
3. Are the cost estimates realistic?
4. Will alternates achieve the same results?
5. Does the budget cover all of the mix?

## V. CONTROL PHASE

*MANAGE—Measure performance against plan and adjust for deviation*
1. Why are expenditures running ahead (or behind) of plan?
2. Is the mix (promotion, people, price, place) wrong?
3. Should planning assumptions be changed?
4. Does the forecast require adjustment?
5. Must more money be spent?

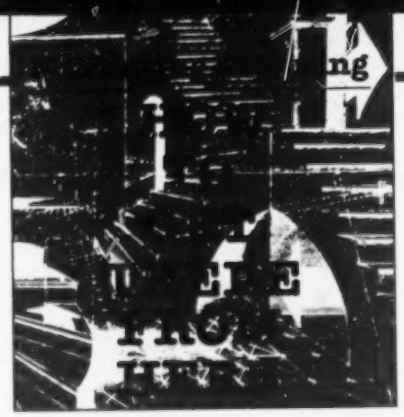


Figure 1

**SAMPLE MARKETING PLANNING MODEL TO ESTIMATE TOTAL MARKET SIZE**

DEMAND FOR LOADING PRODUCT A = RAILROAD TON MILES × CARLOAD SIZE FACTOR × TRIP LENGTH FACTOR + TRUCK TONS SHIPPED × TRUCK SIZE FACTOR

# How Signode Corp. does it, step-by-step

By BERNARD A. RAUSCH
Director, Business Research and Economic Analysis
Signode Corp.

We all know that planning is catching on. We know there are ways to make plans well-founded, but not foolproof, and we are working to develop swift methods of recourse in case we've made a planning error.

Making strategic allowances for projected change can be quite different depending upon the type of activity being considered. First, how can we make allowance for projected change in existing business situations? Second, how can we make the scanning/planning linkage for development activities? Here's how, taking existing business first:

*Business models.* The forecast of key factors known to have been important indicators of past performance must be incorporated. For example, in many companies an industrial production index forecast for lumber, or a forecast of the future population of 30–50-year-old working females, or a forecast of the number of multi-unit housing starts, or a long-term forecast of the number of yearly miles each American car is likely to travel between now and 1985, or combinations of these, are placed into the model and a feeling for the future is obtained.

The existence of the model almost guarantees that salient factors must be sought out and used. Figure 1 is a model which relates sales of antidamage transportation products such as air bags and void filler to a number of important variables. Data in the equation refer to the general level of economic activity (railcar loadings and truck freight miles) to predict overall sales of all similar products in the marketplace. Models can be used to predict penetration of the overall market but to do this, work must be done to understand how our price, advertising, and expended sales time correlate with sales (Fig. 2). However, care must be taken to personalize planning and to encourage imagination and creativity in developing new strategies. (Models are useful predictors but they don't create action plans. People, using models as an input, create winning programs.)

*Planning guidelines.* The discipline of a formal guide can help insure that important factors are considered. It doesn't have to be a straitjacket but simply a check list or guideline. Couple the format with direction given by the business's managers, who are trained to recognize the need to incorporate projections for change, and you have a strong driving force for the linkage between externals and your business. Figure 3 shows how one company set down its guidelines for planning for existing businesses. Both the Critical Planning Assumptions and the Ten-Year Goals for the Division require being plugged into the outside world. Figure 4 offers some examples of this.

*Trained planning assistance.* The presence of a professional, who understands the general planning concerns at the business level, is of great value in assuring that linkages are made between the functions within a business, between the business and the division, between the business and the corporate staff, and between the business and the world outside (Fig. 5). When the strategic business unit is big enough for the planner to work on planning issues on a full-time basis the presence of an on-board planner protects against fits and starts and permits education, liaison assistance, and regular monitoring to be done. If it is not reasonable to use full-time effort at the strategic-business-unit level, a planner or group at the division level can serve the same purpose.

*Group planning meeting.* These are well-structured meetings in which the gamut of issues both external and internal is explored frankly and completely (Fig. 6). An agenda is prepared that makes it a point to touch on worldwide subjects and assign responsibility for exploring the relationship

*The above is an excerpt from an address, given at the Conference Board's 1981 Marketing Conference, by Bernard Rausch.*

*© The Conference Board, Inc.*

Figure 2

**SAMPLE MARKETING PLANNING MODEL TO ESTIMATE PENETRATION VS. COMPETITION**

ABC's SALES OF LOADING PRODUCT A = WEIGHTED DIRECT SELLING TIME FUNCTION + WEIGHTED ADVERTISING/SALES PROMOTION FUNCTION + WEIGHTED PRICE-VALUE FUNCTION + WEIGHTED DISTRIBUTION POWER FUNCTION

Figure 3

**STRATEGIC PLAN DIVISIONAL SUMMARY**

- HIGHLIGHTS OF CHANGES FROM PRIOR PLAN
- CRITICAL PLANNING ASSUMPTIONS
- TEN-YEAR GOALS FOR THE DIVISION
- FIVE-YEAR OPERATING OBJECTIVES:
  SALES, INCOME, RETURN ON MANAGED ASSETS
- DIVISION STRATEGY FOR REACHING OBJECTIVES:
  ACQUISITION
  NEW PRODUCT DEVELOPMENT
  INTERNAL R&D
  ORGANIZATIONAL CHANGE NOT SHOWN IN SBU STRATEGY -

Figure 4

**EXAMPLES OF WHERE SCANNING/PLANNING LINKAGES ARE NEEDED**

CRITICAL PLANNING ASSUMPTIONS
- COMPETITOR D EXISTS
- FORECAST CURRENCY-EXCHANGE RATES
- SHORTAGE OF RAW MATERIAL WILL RESULT IN SHARPLY HIGHER PRICES

TEN-YEAR DIVISIONAL GOALS
- VERTICALLY INTEGRATE TO OWN RAW MATERIAL SOURCE
- USE STATE-OF-THE-ART TECHNOLOGY TO REDUCE PROCESS COSTS
- EVALUATE CAREFULLY RISKS OF ENTRY BEFORE EXPANDING ABROAD

Figure 5

**THE LIAISON ROLE OF THE PLANNER**

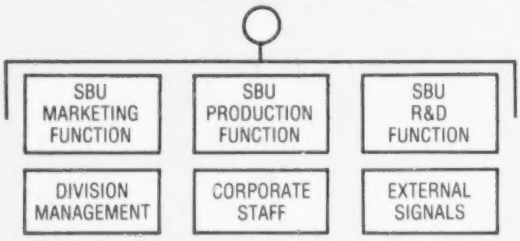



Figure 6

**GROUP PLANNING MEETINGS**

WHAT IS OUR REAL SHARE?
SHOULD WE MARKET IN ELDECEVIA?
CAN LASERS AFFECT OUR BUSINESS?
HOW DO WE SEGMENT?
WHEN WILL INTEREST RATES DROP?

Figure 7

**DEVELOPMENT OF BUSINESS SCENARIOS**

| STEPS | EXAMPLES |
|---|---|
| 1. IDENTIFY EXTERNAL INFLUENCE FACTORS | SOCIETAL, POLITICAL, MACROECONOMICS |
| 2. DESCRIBE COMPONENTS OF FACTORS | WORK ATTITUDES, REGULATIONS, INFLATION |
| 3. BUILD SET OF SCENARIOS | LIKELY, OPTIMISTIC, PESSIMISTIC |
| 4. DEVELOP A STRATEGY FOR EACH SCENARIO | GROW WITH THE MARKET, EXPAND SHARE |

Figure 8

**EXAMPLE OF CONTINGENCY PLANS/ISSUES**

DISCUSS STEPS TO BE TAKEN UNDER THE FOLLOWING CONDITIONS:
1. LABOR STRIKE
2. RAPID FALL-OFF IN PRODUCT DEMAND
3. RAPID INCREASE IN PRODUCT DEMAND
4. STRONG ATTACK BY COMPETITION ON MARKET SHARE

Figure 9

**A CONTINGENCY PLANNING MODEL BY STEPS**

1. IDENTIFY THE MAJOR CONTINGENT EVENTS, INTERNAL AND EXTERNAL, AND LIST PROBABILITY OF OCCURRENCE.
2. ESTABLISH AND TRACK WARNING INDICATORS.
3. DEVELOP STRATEGIES AND TACTICS THAT WILL TAKE ADVANTAGE OF THE OPPORTUNITY OR MINIMIZE THE THREAT.

between these issues and the business.

At these meetings, problems are identified and a consensus is obtained on the need for further clarification. Some of the crucial issues that may require digging into more deeply might include a better understanding of competition and our real share of the market, the danger of marketing in "Country D," the problem of government intervention or control, and the effect of a new technology. The American Management Assns. team planning system has been used successfully to cover all bases in a group dynamics framework.

*Scenario building.* The technique of writing scenarios describing possible situations automatically requires thinking about outside factors and their effect on your business. Multiple scenarios describing alternative futures are usually included in carrying out this technique. Forcing some thinking about how the future can vary is a sure way to explore scanning/planning issues. The three-scenario technique, in which most likely, optimistic, and pessimistic scenarios are written, is very popular. Figure 7 offers some steps to be used in developing these scenarios. Note that the external view is a key to writing the scenario.

*Contingency planning.* This technique attempts to produce surprise-free plans. Strictly defined, it is the advance preparation of a strategy to cope with a low-probability event that could have a significant effect on the strength of the business. A popular approach: contingency plans are required for four conditions (Fig. 8). A model of the contingency planning process shows very clearly that external events must be dealt with to do good contingency planning (Fig. 9).

We have just described ways of dealing with

Figure 10

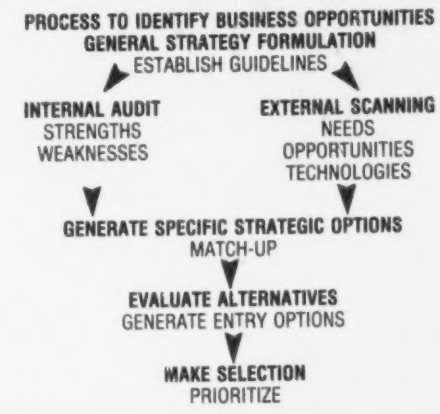



Figure 11

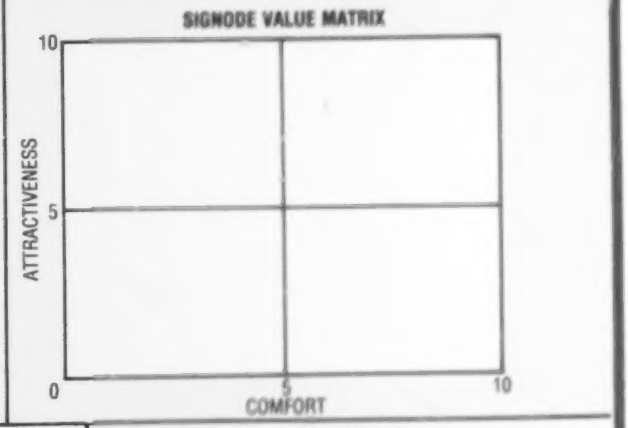



Figure 12

VALUE MATRIX—LASER MARKING
COMFORT CRITERIA

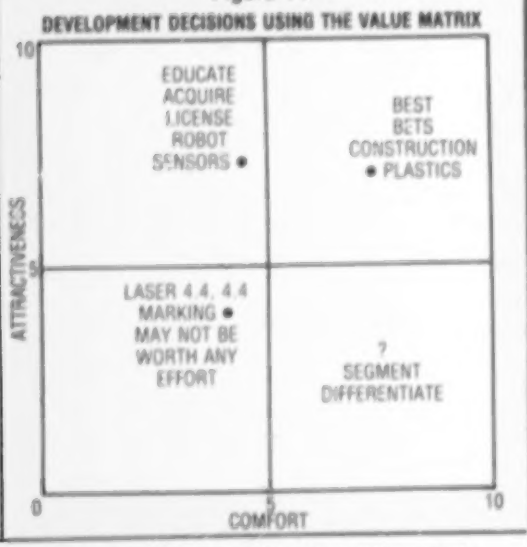
| WEIGHT | FACTOR | RATING | VALUE | SCORE |
|---|---|---|---|---|
| 0.2 | FAMILIAR TECHNOLOGY | NO | 1 | 0.2 |
| 0.2 | FAMILIAR MARKETS | YES | 10 | 2.0 |
| 0.2 | FAMILIAR MFG. TECHNIQUES | SOMEWHAT | 5 | 1.0 |
| 0.2 | DEVICE AND CONSUMABLE | NO | 1 | 0.2 |
| 0.2 | LOW RATE OF TECHNOLOGY CHANGE | SOMEWHAT | 5 | 1.0 |
| | | | TOTAL | 4.4 |

Figure 13

VALUE MATRIX—LASER MARKING
ATTRACTIVENESS CRITERIA

| WEIGHT | | RATING | VALUE | SCORE |
|---|---|---|---|---|
| 0.2 | HIGH ESTIMATED IRR, % | MODERATE | 5 | 1.0 |
| 0.2 | HIGH REAL MARKET GROWTH | YES | 10 | 2.0 |
| 0.2 | COMPETITIVE INTENSITY | MODERATE | 5 | 1.0 |
| 0.2 | PROPRIETARY POSITION POSSIBLE? | NO | 1 | 0.2 |
| 0.2 | POTENTIAL TO CONTRIBUTE MORE THAN 20% OF 1990 EARNINGS? | NO | 1 | 0.2 |
| | | | TOTAL | 4.4 |

Figure 14




external-internal linkages for existing businesses. Now let's look at one technique that does the same thing for development operations. Identifying new business opportunities can be divided into six basic steps, as shown in Fig. 10.

Scanning for external needs, opportunities, and technologies is a crucial part of this process. How to relate outside factors to internal planning for new development has been a never-ending quest. One way to do it is to compare external factors with internal strengths and the company's development guidelines to determine whether a match-up is possible.

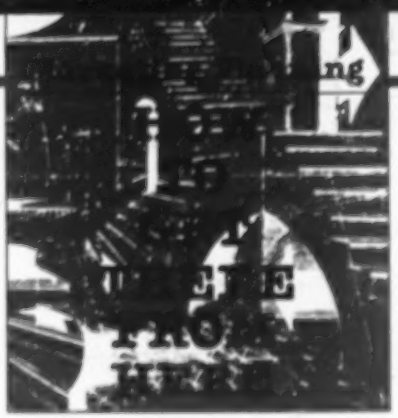
One device which we have found useful is the Signode Value Matrix which is shown in Fig. 11. This diagram permits us to position the most attractive potential opportunities in the matrix by analyzing their potential in the markets and their ability to be understood and managed by our staff of corporate executives.

Figure 12 shows a set of factors which might measure the degree of "comfort" that a group of managers feels when it evaluates a "candidate"—in this instance laser marking. The example shows how the value score is calculated. These factors are subjective and will vary between companies and even within a company or division or between strategic business units. If agreement on the factors that make up the feeling of "comfort" can be achieved this technique can be useful to eliminate some of the hundreds of candidates that are looked at yearly. A perfectly "comfortable" candidate would score a 10.

Figure 13 shows one set of factors that might measure the opportunity's attractiveness. Market growth, competitive intensity, financial "goodness," and patent position are shown in this set, again, a perfect effectiveness score would be 10.

Looking at the value matrix (Fig. 14), it can be noted that the upper right-hand quadrant is the area that signals a high degree of desirability. This technique puts measures of internal comfort together with externally-arrived-at attractiveness criteria. The value matrix is one way to insure linkage in the new product development area.

All is not bleak. If you understand that good planning requires good linkage and that good linkage needs to be applied by marketers of creativity and vision, marketing planning will be more productive and effective.



# Using S&MM's Surveys to define tomorrow today

As marketers plan, especially in such areas as establishing precise objectives, devising a marketing strategy, and deploying the sales force, they will find that the *1981 Survey of Buying Power* contains essential information that is not available elsewhere.

Two *Survey* features, the Buying Power Index (BPI) and Effective Buying Income (EBI), are often useful in that they show how actual patterns contradict what seems apparent. For instance, population decline does not necessarily indicate a market decline. A case in point is the Northeast, where population has declined, but where household buying power is still substantially greater ($3,000–$5,000 per year per household) than in the Sunbelt, where population is growing. British Airways, for example, can use this and other data from the *Survey* to determine just when, and how many, of its people to move to the Sunbelt, says John Power, the airline's market analysis manager, U.S.A.

### *Locate test markets*

In sales analysis, the *Survey* is extremely useful. "The BPI is a great source of information and knowledge for our company," says John Flood, assistant vice president, sales and marketing, Pennsylvania Dutch Co., a Mount Holly Springs, PA, confectioner. "It lets us see where we stand in the spectrum of U.S. sales."

George W. Matson, senior director of sales and merchandising, Clairol, says that "the *Survey* is one of the most important tools we use to try to determine where to test market our items." His company recently used the 1980 *Survey* prior to deciding where to test market a new home-permanent product, but using the *Survey* that way isn't unusual. "Because we have more than 350 items, we're always test marketing something somewhere," Matson adds.

Clairol was able to locate the exact market it wanted—a market with enough women over 35 and households with incomes of between $10,000 and $25,000 a year. Clairol found those characteristics in the Cleveland market, which includes Cleveland, Pittsburgh, and Buffalo, NY. After determining the EBI and the BPI to confirm that consumers in that market had sufficient disposable income, Clairol decided to proceed with testing.

### *Establish sales potential*

When deregulation of the airline industry suggested to British Airways that it expand service in the U.S., it also found a need for the *Survey*. "We had to determine the metropolitan areas that held the most potential for our service," Power says. "Because you have to be flexible and be able to react quickly to survive in this industry today, we have to continually update our research. The *Survey*, along with other data that we use, enables us to pinpoint the metro areas where we want to operate by giving us population and demographic breakdowns. It enables us to forecast remarkably well."

By combining *Survey* information with government statistics to determine the number of passport holders in various markets, Power realized that Seattle and New Orleans held more promise for British Airways than Pittsburgh and Cleveland. Power says that "The *Survey* gives us the three pieces of information that we need to combine with our other data and that show us where we want to be: population, household income groups, and average household income."

Figures showing retail sales by store group help Sandra Betner, national sales analyst, Elizabeth Arden, New York City, in setting sales strategy.

"We set up a computer report for our sales along the same lines as the *Survey* is set up—county by county," she says. The *Survey* informs her specifically of general merchandise group and drug store sales, the categories in which most Elizabeth Arden products are sold.

Betner describes a procedure for using the *Survey*, taking Anniston, AL, the first county listed, as an example. "Our computer gives me the

accounts we have in Anniston, broken down by department [general merchandise] and drug stores, and what our total sales were in each," she says. "I then get a total sales figure for that market and figure what percentage it was of our national sales. When I compare that to the percentage of the total U.S. market that Anniston represents, I get what we call our 'relative strength' figure. This is what we're really looking for." Betner then repeats this calculation for each market.

"The *Survey* is the only outside data we use," Betner says. "Without it, all we'd really have to use in planning the coming year is this year's sales vs. last year's."

Numerous companies have found that the *Survey* is also a valuable tool in acertaining sales territory potential, market analysis, and allocation of media spending. Both Clairol and British Airways use it to determine how best to deploy a sales force by monitoring population shifts and changes in buying patterns. "Our objective is to keep our cost-of-sale-as-percent-of-sale constant," Clairol's Matson says. "We have as large a sales force as we want, but where we want them is often changing."

The sales executive can use S&MM's five-year metropolitan market projections to ascertain what will happen to local markets in that period. He can base his planning on the metro area projections in several ways. Focussing on the markets with the biggest percent change for 1980–85 facilitates positioning in the fastest-growing markets, markets that will require additional sales personnel.

Markets that will grow less than the 5.5% anticipated for the total U.S. can be identified. This allows the sales executive to avoid overspending in markets with a diminishing share of the U.S. market.

It's possible to see that 4 of the big 10 markets are likely to lose population: New York City, down 3.0%; Philadelphia, down 1.0%; and Detroit and Boston, each down 0.5%. Better projections are available as to where to redeploy a sales force in the future, thus allowing concentration on those markets where additional personnel can exploit a rising sales potential.

The *Survey* provides the Average Effective Buying Income Per Household for each market for the years 1980 and 1985. By comparing these two figures, the sales executive can calculate percent change between them, and can thus determine which markets will achieve the fastest growth in relative affluence. Different markets can then be compared on a more objective basis, establishing their relative appeal.

The third element of the *Survey*'s metro projections is retail sales. Using these statistics, the marketer can locate local markets that will be increasingly important in his future strategy.

## Security Pacific researches the future

Recent developments in financial markets—regulatory changes and corporate mergers, especially—are bringing changes to the U.S. banking industry. Historically the sleepy repositories for everyman's money, now banks are forced to compete for funds with other financial institutions. Because of heavy regulation in the past that maintained the status quo, banks are belatedly defining systems for long-term planning. Few bank marketers are able to ascertain in relevant detail what their markets will look like in five years, or how to address them.

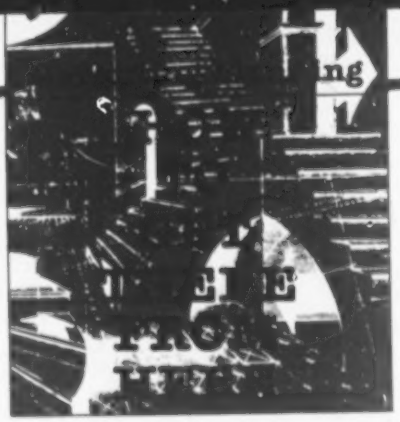
*'Futurist' Koehn*

An exception is Security Pacific Bank, Los Angeles. It has created a Futures Research Div., where Hank Koehn is vice president and director. His goal: "to create a futures attitude in the bank." His division takes the view that things are not going to be the same in the future. "We monitor the world for signals of change," Koehn says. Thus he tries to anticipate the direction of financial markets, and in so doing, keep a future-oriented "mindset" alive throughout the bank.

Planning is generally done by each line division (International Banking, for example), whose top executives meet once a year for a few days. In addition to the "resources" they bring with them—their knowledge of the industry and experience—they work at the meeting with a "data package," studies of important social, environmental, and technical issues that are likely to have an impact on the bank in the coming five years. A key element in the package is input from observers of government affairs, whose job it is to anticipate regulatory and legislative changes.

The Futures Research Div. helps to put together the data package. It also is responsible for an even longer-term view. It's not unlikely to consider 10 year implications of demographic changes, or to create scenarios of 20 years hence. A recent scenario had to do with the increasing banking activity of senior citizens, enabling the bank to prepare appropriate adjustments in its operations.

A Strategic Planning Div., under vice president Terry Perucca, is responsible less for actual planning than for making sure that plans within various divisions are in concert, and that these plans "fulfill goals and objectives of Security Pacific," Koehn says.



# Inside the information centers

By GERSON GOODMAN

"Our annual plan is absolutely vital to the business," says National Distillers & Chemical's Joseph F. Pilaro. Now director of the firm's U.S. Industrial Chemicals Co., Pilaro was central to the division's planning function before moving up to his present spot.

"Without our plan," he declares, "we would not have been successful. Thanks to the foresight of D.C. Bell, then chairman of the board, we were fortunate to get into the game early. In the 1960s, we shared in the funding of INFORUM, the pioneering inter-industry econometric model at the Univ. of Maryland, and since that time we have put it to good use. We have done 15-year forecasts that 5 years later were within 3% of actual experience. Thanks to the Maryland model, our planning has led the industry."

Like National Distillers, most corporations depend increasingly on the guidelines the planning departments set. The planners, in turn, try to make sense of today's high-volume, worldwide, rapidly changing marketplace. They can no longer fly "by the seat of their pants." They refer, instead, to the private and public information suppliers, some long established, many of relatively recent origin, to produce the printed and electronic data on which they depend.

Even U.S. Industrial Chemicals, despite its proportionately large investment in its planning activities, turns over 30% of its research assignments to outside consultants. If, for example, Pilaro wanted to look at how much hydrocarbon was available on a world scale over a period of a year, he would farm the question out.

U.S. Industrial Chemicals' own information center is just across the hall from Pilaro's office. Despite the spread of on-line data banks—National Distillers uses the Lockheed bank—company librarian Peggy F. Presson considers the library's clipping files as important for market research, forecasting, and planning, as any information package, computerized or otherwise, she can get from vendors.

*Gerson Goodman is a free-lance writer who specializes in sales and marketing topics.*

*Prestone's McCourt, Doyle Dane Bernbach's Sutliffe.*

"I know from experience which periodicals print articles referring to our industry, our company, and our product lines," she explains. "They include *Oil and Gas Journal, Hydrocarbon Processing, Chemical Marketing Reporter, Modern Plastics,* and so forth. Each week I skim 50 of them and read the tables of contents of 60 more. In addition to being more current, much of the material I spot and file would be too specialized to interest the data banks, or too short for them to include."

The division's annual planning cycle begins in July of the previous year, Pilaro says. Data the sales force gathers in the field by asking customers, account by account, to estimate anticipated consumption, is applied to the forecast modelled by the Maryland econometric center. The annual information is also used to update the three, five, and ten-year plans, and thus, by determining whether or not additional production is needed, affects capital budget decisions as well as immediate operational tactics.

Presson's proclivity for hand clipping relevant periodicals is also recommended by Sandy Sutliffe, Doyle Dane Bernbach advertising agency, New York City. Presiding over a staff of seven,

Sutliffe runs one of the largest special libraries.

Asked what sources she views as essential to the planner's work, she suggests Standard & Poor's "Industry Survey" series and the Dept. of Commerce's "U.S. Industrial Outlook," which, she points out, includes its own ten-year forecast. To those without access to the numerical projections, such as those provided by INFORUM, Chase Econometrics, Data Resources, or other electronic sources, she recommends the 10-year model available in print from the Univ. of California, Los Angeles.

Among the data bases, she says, Predicast and Advertising and Marketing Intelligence are likely to respond usefully to planner-initiated searches. More selective banks, such as Paper Industry Research Abstracts, are also available as the search narrows, Sutliffe notes.

But don't give up on print, she warns. Before turning to the data base, she suggests, it's better to get acquainted with the subject by using a clipping file or a publication index like *Predicasts F&S*. Reading in advance, Sutliffe explains, makes the researcher more knowledgeable about the industry being studied and its terminology.

### *Go to Harvard*

Academic sources can also be helpful, she adds. She advises planners to become acquainted with the Harvard graduate school's regularly revised bibliographies on business subjects. Harvard's celebrated case study approach to corporate management, she says, can be investigated by referring to its *Intercollegiate Bibliography of Selected Cases in Administration.*

Marketing manager Robert S. Mitchell and marketing research director Joseph McCourt are "hands on" planners for Union Carbide's Prestone brand of antifreeze. "It's my job to provide Bob with the marketing surveys, audits, and forecasts," McCourt explains. "From them, he constructs the plan."

Like Pilaro at U.S. Industrial Chemicals, the Prestone executives make use of macroeconomic data supplied by forecasters like Data Resources. Prestone's Danbury office also purchases "hard" data from two bases concerned solely with the automotive industry: R.L. Polk, and National Aftermarket Audit, which report by make, model, and age the number of vehicles in operation.

For their own input, they refer to a variety of sources, some of which are generally available, some of which they commission themselves. In the former category, McCourt lists the annual report by the Chemical Specialties Manufacturers' Assn. "As in many other industries," he said, "each producer anonymously reports his volume to the association. The aggregate figures are checked by an independent auditing firm and then included in a final report which is made available to the association's membership.

But Prestone seeks more specific information in constructing its market plan than even Nielsen and its competitor can offer. To reach a national consumer cross section with questionnaires designed in-house, the firm uses mail panels developed by such vendors as National Family Opinion Poll, the Home Testing Institute, and Market Facts. McCourt also regularly consults Union Carbide's business library, primarily to check broad economic and demographic patterns.

"You don't plan once a year. It's a constant thing," Mitchell reflects. "If somebody sees a blip somewhere along the line—say we learn Detroit is going to downsize the cars even more severely than it had announced six months earlier—we plug in the new numbers. What comes out may or may not alter our plan."

### *Go to Commerce*

The Union Carbide planners, as well as the other information interpreters S&MM consulted, agree that Uncle Sam himself is an indispensable data source. McCourt says, "Different parts of the government are constantly producing historical reports and recent studies and making projections, some of which are more or less relevant to our business. Once you get on their lists, the material keeps coming to you.

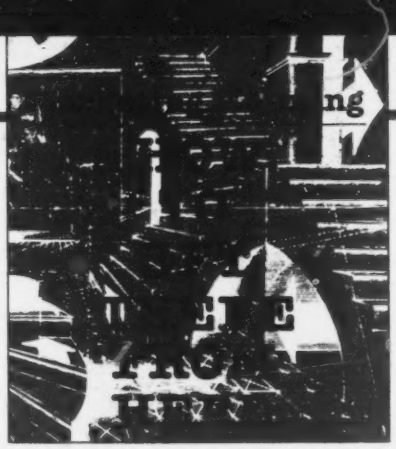
The federal government's most frequently referred to statistics, such as the Census Bureau's reports on business and manufacturing, are available at no charge in Dept. of Commerce offices in larger cities throughout the country. The bureau's pamphlet, *Census Products and Services*, is distributed at all of them.

Less well known than Commerce's 44 regional offices are its two Business Reference & Research Section libraries, one in Washington, DC, the other in New York City, where information specialists maintain industry by industry files and regularly issue detailed reports based on them. The New York City research library is located at 26 Federal Plaza (212-264-0630). In Washington the address is 14th St. at Constitution Ave., N.W. (202-377-5511).

Dealing with the torrents of data that are created daily by the government, in business, and on the campus is in itself a specialized job. Workers in the data industry trying to project the vagaries of the market follow varied paths to accomplish it.

Some depend on their company's information center to pass current developments along to them; others, like Prestone's McCourt, bird-dog the trade shows and meetings concerned with electronic or printed data. "You have to get out there," McCourt says, "to find out what's available and to evaluate the suppliers."

Difficult though it may be to keep abreast of all the information that's available, it is essential for reliable planning. "It's like having a compass," says Union Carbide's Mitchell. "You can get by by looking at the shoreline, but if you have a compass on the ship you can tell exactly what you are doing and make your corrections."



# The sales force has a big say at Gerber's

By BOB WOODS
Associate Editor

Marketing planning at Gerber Products was probably a lot easier back in the days when babies really *were* its only business. In the decade since it began diversifying beyond its baby food domain into such markets as infantwear, day care centers, life insurance, and even trucking, Gerber's marketing planning has become more than forecasting birth rates and infants' eating habits. And with the help of the field sales force, one of Gerber's marketing planners has developed a system that is aiding the company's entrance into nonfood markets.

Two years ago Gerber split into separate food and nonfood (or general merchandise) divisions. (The day care centers, life insurance company, and the trucking firm operate autonomously.) The baby food division, with more than 200 varieties, has 70% of the U.S. market, and generated most of Gerber's $630 million sales last year. However, sales of the company's 600 general merchandise items—including infant clothes, feeding utensils, exercisers, humidifiers, and vaporizers—continue to move Gerber into the total baby-care position it is aiming toward.

Soon after the two divisions were in place, Gerber appointed Blaine L. Hilton vice president of marketing planning for general merchandise. Coordinating efforts with Bob Erver, vice president, special products sales, and Jerry Ward, director of marketing planning for the food division, Hilton oversees the product managers, marketing research, and marketing services for the nonfood products. All of Gerber's 800 salespeople sell the company's complete nonfood line, though 100 of them sell just general merchandise, and only in nonfood outlets. Food stores remain the best outlets, but other retail stores are gaining importance.

Hilton says that Gerber must depend on input from the national field force more than the average company does. "Fremont is not exactly a beaten path," he says, in reference to Gerber's less-than-strategic location in this small western Michigan town, an hour from Grand Rapids. For this and other reasons, he insists, he must "rely very heavily on the field reps" in his marketing planning. And he speaks from experience on the other side too; he was a Gerber salesman for 30 years in Stamford, CT.

Hilton develops both a one-year and five-year plan for each general merchandise item, putting them into various categories. Obviously, Hilton says, the one-year plan is more accurate. "The five-year plan is hard to hit on the nose, but it makes people think," he says, adding that the reps' cumulative input over the years is particularly vital in his long-range planning.

At the same time Hilton works on the general merchandise planning, Jerry Ward designs a marketing plan for the food products. Noting the food division's commanding market share, Hilton suggests that his task is more complicated than Ward's. Along the way, therefore, Hilton requests input from the field reps to help design, and also implement, his plan. The plans are reviewed and

*Blaine Hilton (l.), Jerry Ward, and Bob Erver: together, they do the planning for Gerber's general merchandise.*

approved by company officials, and are then merged to take effect on Apr. 1 of each year, when the company's fiscal year starts.

Copies of the complete plan are sent to Gerber's 14 division managers, 7 each for food and nonfood. They pass along information relative to the company's 32 district sales managers. The individual reps finally receive quarterly sales and marketing objectives from territory managers three months in advance. During this time they file detailed written reports to the division managers. These reports are the wedge Hilton hopes will help drive Gerber into more nonfood markets.

There is no actual form for the reps' reports, although they're all expected to answer some of the same basic questions. Aside from requesting comments on certain parts of the quarterly marketing plan, the reports ask for information on particular market conditions, brand shares, and Gerber's overall position in those specific nonfood marketplaces, based on every rep's personal experiences.

Hilton emphasizes that this input is critical when dealing with so many dramatic and subtle differences in infant markets across the country. "We must rely on the field sales force for marketplace information," he says. "The salesmen offer overall appraisal. We're guided by their suggestions."

The complete marketing plan is updated every quarter, after the 14 division managers have scrutinized the reps' reports. Twice a year the division managers meet with Hilton, Erver, and Ward in Fremont. Hilton generally describes his marketing planning as being "top down," or management inspired, though at this point he says it tends to turn "bottom up," with the sales force determining some elements. "We like a constant flow of information from the field reps," he says. "If the plan doesn't work, we want to find out *now*, before it's too late."

Hilton says that Gerber is "flexible" in making suggested changes in the marketing plan, with certain cost limits. While the company might reconsider the color of a T-shirt, it would not be likely to change the size of a baby bottle, because that would require expensive retooling.

Hilton recalls how reports from the sales force made a big difference recently. Last year's nonfood marketing plan outlined the introduction of a new line of coveralls. Armed with information from the reps' reports, the division managers suggested revising parts of the plan, which was done to everyone's satisfaction. Hilton says that as a result the reps "felt an obligation in selling because they were involved. They have a part, a choice to say yes or no."

As Hilton initiates his 1982 marketing plan this fall, he is combining the reps' comments with federal and industry data, including birth rates (which, incidentally, were up 14% in 1980), trends in first births to families (who become prospects for Gerber's full line as the family grows), and other demographics pertaining to infants. Although Gerber uses in-house computers for sales forecasting, Hilton wishes the company would investigate more ways to use the machines in marketing planning, especially when he's confronted with such a flood of raw material.

Following positive third-quarter financial statements that indicate Gerber is well on the way to meeting its projected 10% rise in net earnings for fiscal year 1981, Hilton is confident that his planning strategy will contribute to the company's growth in nonfood markets. "We don't go right out and ask the salespeople what they want," he says, "but the quarterly reports make a difference."

## Betting on your best bet

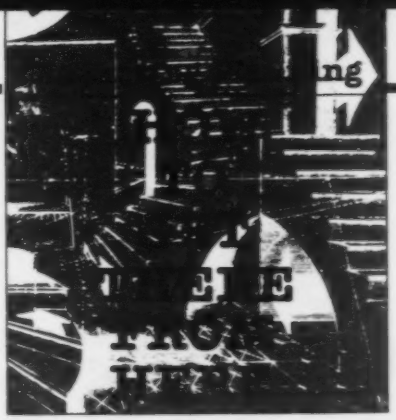
**Since future events and conditions cannot be predicted consistently with complete accuracy, the end product of the forecasting process can best be described as giving advice. In most cases, that advice is provided in the form of a single *best-bet* figure that represents either the value of a time series at a specific time or the cumulative value of the series at the end of a specific period of time. It is the point at which there is an even chance that the future outcome will fall above or below it.**

**The best-bet approach is a widely accepted method of providing advice about the future, because it facilitates precise planning and decision making. Its primary weakness, however, is that planning and decision-making processes assume that the forecast describes the future precisely, when in fact it cannot perform such a feat.**

From *The Professional Forecaster: The Forecasting Process Through Data Analysis*, by James P. Cleary and Hans Levenbach, published by Lifetime Learning Publications, Belmont, CA.

## Would you trust a researcher?

**When Norman Lear tried to sell CBS brass on his idea for a new comedy show, *All in the Family*, he ran into considerable opposition. (For one thing, then CBS chairman William Paley hated the show; he thought that it was vulgar.) The people in the network's research department came up with a "solution" to (1) getting the program on the air and (2) ensuring its success with viewers: change Archie Bunker into a mild-mannered man, supportive of his family.**



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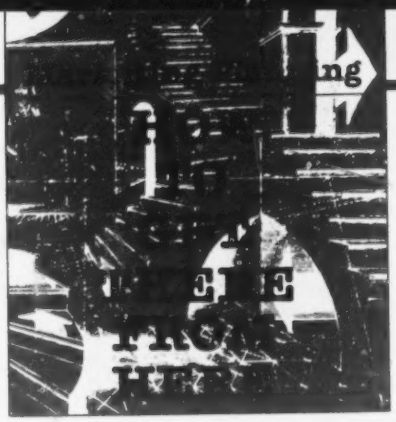

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| County SIC | Metro Area Industry | Number Of Plants: Total Plants | Number Of Plants: Large Plants | Total Shipments ($ Mil) 1981 (S&MM Est) | % Of U S Shipments | % In Large Plants |
|---|---|---|---|---|---|---|
| 2261 | Cotton-finishing plants | 3 | 2 | 62.6 | 5.9944 | 99 |
| 2321 | Men's & boys' shirts & nightwear | 3 | 3 | 40.5 | .9695 | 100 |
| 2824 | Noncellulosic synthetic organic fibers | 2 | 2 | 446.7 | 4.4071 | 100 |
| 3011 | Tires & inner tubes | 2 | 1 | 209.5 | 1.9232 | 95 |
| 3079 | Miscellaneous plastics products | 9 | 1 | 70.1 | .2567 | 69 |
| 3552 | Textile machinery | 11 | 2 | 72.4 | 3.6894 | 73 |
| **Sumter** | **All mfg.** | **56** | **18** | **755.0** | **.3392** | **84** |
| 2038 | Frozen food specialties | 1 | 1 | 257.3 | 5.9171 | 100 |
| 2511 | Wood household furniture | 2 | 2 | 44.5 | .8727 | 100 |
| **Union** | **All mfg.** | **26** | **15** | **306.7** | **.0159** | **87** |
| 2261 | Cotton-finishing plants | 3 | 2 | 37.8 | 3.6196 | 98 |
| **Williamsburg** | **All mfg.** | **19** | **9** | **242.8** | **.0126** | **85** |
| **York** 236 | **All mfg.** | **77** | **26** | **984.0** | **.0511** | **85** |
| 2211 | Cotton-weaving mills | 4 | 3 | 87.8 | 1.6026 | 98 |
| 2261 | Cotton-finishing plants | 5 | 1 | 31.3 | 2.9972 | 86 |
| 2262 | Synthetics- & silk-finishing plants | 1 | 1 | 141.4 | 5.2256 | 100 |
| 2823 | Cellulosic man-made fibers | 1 | 1 | 145.8 | 9.1543 | 100 |
| **State Total** | **All mfg.** | **2,038** | **897** | **30,149.5** | **1.5654** | **86** |

## SOUTH DAKOTA

| | | | | | | |
|---|---|---|---|---|---|---|
| **Aurora** | **All mfg.** | 1 | | 1.5 | .0001 | 0 |
| **Beadle** | **All mfg.** | 22 | 3 | 202.3 | .0105 | 55 |
| **Bon Homme** | **All mfg.** | 4 | | 7.9 | .0004 | 0 |
| **Brookings** | **All mfg.** | 15 | 3 | 122.1 | .0063 | 67 |
| **Brown** | **All mfg.** | 26 | 6 | 188.7 | .0098 | 54 |
| **Brule** | **All mfg.** | 1 | | 2.8 | .0001 | 0 |
| **Buffalo** | **All mfg.** | 1 | | 3.4 | .0002 | 0 |
| **Butte** | **All mfg.** | 5 | | 13.4 | .0007 | 0 |
| **Campbell** | **All mfg.** | 2 | | 18.1 | .0009 | 0 |
| **Charles Mix** | **All mfg.** | 2 | | 21.0 | .0011 | 0 |
| **Clark** | **All mfg.** | 2 | 2 | 22.4 | .0012 | 100 |
| **Clay** | **All mfg.** | 7 | 1 | 35.2 | .0018 | 41 |
| **Codington** | **All mfg.** | 28 | 8 | 136.1 | .0071 | 58 |
| **Corson** | **All mfg.** | 1 | | 4.4 | .0002 | 0 |
| **Custer** | **All mfg.** | 4 | | 6.1 | .0003 | 0 |
| **Davison** | **All mfg.** | 15 | 1 | 122.2 | .0063 | 37 |
| **Day** | **All mfg.** | 5 | 1 | 43.3 | .0022 | 58 |
| **Deuel** | **All mfg.** | 1 | | 3.9 | .0002 | 0 |
| **Dewey** | **All mfg.** | 1 | | 6.6 | .0003 | 0 |
| **Douglas** | **All mfg.** | 4 | | 6.4 | .0003 | 0 |
| **Edmunds** | **All mfg.** | 2 | | 6.1 | .0003 | 0 |
| **Fall River** | **All mfg.** | 4 | | 14.2 | .0007 | 0 |
| **Grant** | **All mfg.** | 10 | 2 | 80.3 | .0042 | 50 |
| **Gregory** | **All mfg.** | 4 | | 12.3 | .0006 | 0 |
| **Haakon** | **All mfg.** | 1 | | 3.0 | .0002 | 0 |
| **Hamlin** | **All mfg.** | 1 | | 14.4 | .0007 | 0 |
| **Hand** | **All mfg.** | 3 | | 5.7 | .0003 | 0 |
| **Hanson** | **All mfg.** | 1 | | 3.2 | .0002 | 0 |
| **Hughes** | **All mfg.** | 5 | | 12.1 | .0006 | 0 |
| **Hutchinson** | **All mfg.** | 9 | | 33.1 | .0017 | 0 |
| **Jerauld** | **All mfg.** | 1 | | 2.9 | .0002 | 0 |
| **Jones** | **All mfg.** | 2 | 1 | 7.8 | .0004 | 46 |
| **Kingsbury** | **All mfg.** | 6 | | 14.3 | .0007 | 0 |
| **Lake** | **All mfg.** | 9 | 4 | 57.1 | .0030 | 80 |
| **Lawrence** | **All mfg.** | 6 | | 17.0 | .0009 | 0 |
| **Lincoln** | **All mfg.** | 9 | 1 | 49.9 | .0026 | 11 |
| **Lyman** | **All mfg.** | 1 | | 3.0 | .0002 | 0 |
| **McCook** | **All mfg.** | 9 | | 29.3 | .0015 | 0 |
| **McPherson** | **All mfg.** | 1 | | 11.1 | .0006 | 0 |
| **Marshall** | **All mfg.** | 6 | | 23.9 | .0012 | 0 |
| **Meade** | **All mfg.** | 7 | | 35.3 | .0018 | 0 |
| **Minor** | **All mfg.** | 3 | | 4.9 | .0003 | 0 |
| **Minnehaha** 262 | **All mfg.** | 75 | 18 | 920.5 | .0478 | 69 |
| 2013 | Sausages & other prepared meats | 1 | 1 | 449.6 | 3.8035 | 100 |
| **Moody** | **All mfg.** | 5 | | 14.3 | .0007 | 0 |
| **Pennington** | **All mfg.** | 44 | 11 | 386.0 | .0200 | 68 |
| **Perkins** | **All mfg.** | 1 | | 3.7 | .0002 | 0 |
| **Potter** | **All mfg.** | 3 | | 9.9 | .0005 | 0 |
| **Roberts** | **All mfg.** | 4 | | 13.9 | .0007 | 0 |
| **Sanborn** | **All mfg.** | 1 | | 1.2 | .0001 | 0 |
| **Shannon** | **All mfg.** | 1 | 1 | 2.5 | .0001 | 100 |
| **Spink** | **All mfg.** | 2 | | 15.3 | .0008 | 0 |
| **Stanley** | **All mfg.** | 2 | | 11.9 | .0006 | 0 |
| **Todd** | **All mfg.** | 2 | | 6.5 | .0003 | 0 |
| **Turner** | **All mfg.** | 5 | | 27.5 | .0014 | 0 |
| **Union** | **All mfg.** | 16 | 3 | 78.2 | .0041 | 52 |
| **Walworth** | **All mfg.** | 2 | | 6.2 | .0003 | 0 |
| **Washabaugh** | **All mfg.** | 1 | | 2.0 | .0001 | 0 |
| **Yankton** | **All mfg.** | 13 | 6 | 165.2 | .0086 | 79 |
| **State Total** | **All mfg.** | **424** | **72** | **3,073.5** | **.1596** | **54** |

## TENNESSEE

| | | | | | | |
|---|---|---|---|---|---|---|
| **Anderson** 139 | **All mfg.** | 32 | 10 | 943.7 | .0490 | 94 |
| 2819 | Industrial inorganic chemicals n.e.c. | 1 | 1 | 728.9 | 5.8661 | 100 |
| **Bedford** | **All mfg.** | 30 | 12 | 271.6 | .0141 | 82 |
| **Benton** | **All mfg.** | 4 | 3 | 34.2 | .0018 | 97 |
| **Bledsoe** | **All mfg.** | 4 | 1 | 7.5 | .0004 | 35 |
| **Blount** 139 | **All mfg.** | 20 | 8 | 1,485.5 | .0771 | 98 |
| 2823 | Cellulosic man-made fibers | 1 | 1 | 246.4 | 15.4706 | 100 |
| 3334 | Primary aluminum | 1 | 1 | 708.5 | 12.0836 | 100 |
| 3353 | Aluminum sheet, plate, & foil | 1 | 1 | 404.5 | 5.3766 | 100 |
| **Bradley** | **All mfg.** | 53 | 26 | 677.8 | .0352 | 87 |
| 2328 | Men's & boys' work clothing | 1 | 1 | 67.0 | 1.2452 | 100 |
| 2512 | Upholstered wood household furniture | 9 | 4 | 57.0 | 1.6355 | 84 |
| 3631 | Household cooking equipment | 3 | 3 | 149.9 | 7.8224 | 100 |
| 3692 | Dry & wet primary batteries | 1 | 1 | 82.4 | 8.9100 | 100 |
| **Campbell** | **All mfg.** | 15 | 3 | 69.7 | .0036 | 64 |
| **Cannon** | **All mfg.** | 5 | 2 | 36.2 | .0019 | 68 |
| **Carroll** | **All mfg.** | 15 | 9 | 181.5 | .0094 | 85 |
| **Carter** 131 | **All mfg.** | 19 | 10 | 273.4 | .0142 | 92 |
| 2823 | Cellulosic man-made fibers | 1 | 1 | 122.5 | 7.6913 | 100 |
| **Cheatham** 183 | **All mfg.** | 9 | 5 | 156.2 | .0081 | 93 |
| 3639 | Household appliances n.e.c. | 2 | 2 | 109.2 | 7.4079 | 100 |
| **Chester** | **All mfg.** | 6 | 3 | 46.1 | .0024 | 83 |
| **Claiborne** | **All mfg.** | 9 | 6 | 65.2 | .0034 | 89 |
| **Clay** | **All mfg.** | 5 | | 22.4 | .0012 | 0 |
| **Cocke** | **All mfg.** | 17 | 15 | 362.3 | .0188 | 99 |
| **Coffee** | **All mfg.** | 39 | 11 | 231.9 | .0120 | 67 |
| 3949 | Sporting & athletic goods n.e.c. | 3 | 2 | 51.3 | 1.7169 | 91 |
| **Crockett** | **All mfg.** | 6 | 2 | 78.7 | .0041 | 83 |
| **Cumberland** | **All mfg.** | 17 | 9 | 142.7 | .0074 | 78 |
| **Davidson** 183 | **All mfg.** | 347 | 107 | 4,497.6 | .2335 | 82 |
| 2011 | Meat-packing plants | 5 | 4 | 476.6 | 1.1223 | 97 |
| 2711 | Newspapers | 3 | 2 | 130.6 | .7142 | 98 |
| 2751 | Letterpress commercial printing | 14 | 5 | 62.3 | 1.0146 | 76 |
| 2824 | Noncellulosic synthetic organic fibers | 1 | 1 | 534.7 | 5.2753 | 100 |
| 3079 | Miscellaneous plastics products | 7 | 2 | 72.2 | .2643 | 85 |
| 3211 | Flat glass | 1 | 1 | 288.8 | 12.4946 | 100 |
| 3661 | Telephone & telegraph apparatus | 2 | 2 | 92.6 | .7110 | 100 |
| 3728 | Aircraft equipment n.e.c. | 1 | 1 | 143.6 | 1.7925 | 100 |
| 3731 | Ship building & repairing | 1 | 1 | 89.2 | .7459 | 100 |
| **Decatur** | **All mfg.** | 7 | 4 | 107.4 | .0056 | 86 |
| **Dekalb** | **All mfg.** | 10 | 6 | 80.6 | .0042 | 87 |
| **Dickson** 183 | **All mfg.** | 15 | 3 | 130.7 | .0068 | 79 |
| **Dyer** | **All mfg.** | 15 | 11 | 386.0 | .0200 | 95 |
| **Fayette** | **All mfg.** | 8 | 4 | 77.4 | .0040 | 73 |
| **Fentress** | **All mfg.** | 8 | 4 | 46.9 | .0024 | 76 |
| **Franklin** | **All mfg.** | 14 | 5 | 98.3 | .0051 | 83 |
| **Gibson** | **All mfg.** | 36 | 25 | 547.1 | .0284 | 95 |
| 3483 | Ammunition, except small-arms, n.e.c. | 2 | 1 | 107.6 | 11.2647 | 98 |
| **Giles** | **All mfg.** | 21 | 9 | 293.3 | .0152 | 82 |
| 3714 | Motor-vehicle parts & accessories | 1 | 1 | 124.0 | .3008 | 100 |
| **Grainger** | **All mfg.** | 7 | 3 | 35.8 | .0019 | 79 |
| **Greene** | **All mfg.** | 26 | 16 | 647.0 | .0336 | 95 |
| 3651 | Radio & TV receiving sets | 1 | 1 | 227.7 | 2.6322 | 100 |
| **Grundy** | **All mfg.** | 7 | 2 | 26.7 | .0014 | 47 |
| **Hamblen** | **All mfg.** | 46 | 18 | 400.4 | .0208 | 82 |
| 2511 | Wood household furniture | 4 | 3 | 71.6 | 1.4041 | 98 |
| 2512 | Upholstered wood household furniture | 5 | 1 | 44.3 | 1.2711 | 82 |

| County SIC | Metro Area Industry | Number Of Plants: Total Plants | Large Plants | Total Shipments ($ Mil.) | % Of U.S. Shipments | % In Large Plants |
|---|---|---|---|---|---|---|
| **TENNESSEE** (cont.) | | | | | | |
| **Hamilton** | **All mfg.** | **247** | **92** | **3,978.5** | **.2066** | **86** |
| 2052 | Cookies & crackers | 2 | 1 | 110.0 | 3.1558 | 94 |
| 2281 | Yarn-spinning mills, except wool | 4 | 4 | 113.8 | 2.4618 | 100 |
| 2824 | Noncellulosic synthetic organic fibers | 1 | 1 | 629.1 | 6.2067 | 100 |
| 2892 | Explosives | 1 | 1 | 95.3 | 9.0349 | 100 |
| 3264 | Porcelain electrical supplies | 3 | 2 | 42.8 | 8.6710 | 97 |
| 3321 | Gray-iron foundries | 4 | 3 | 143.1 | 1.6783 | 97 |
| 3443 | Fabricated plate work (boiler shops) | 6 | 6 | 345.7 | 3.4656 | 100 |
| 3494 | Valves & pipe fittings | 3 | 3 | 164.6 | 2.1167 | 100 |
| **Hancock** | **All mfg.** | **2** | | **6.9** | **.0004** | **0** |
| **Hardeman** | **All mfg.** | **11** | **6** | **148.7** | **.0077** | **95** |
| **Hardin** | **All mfg.** | **14** | **5** | **186.1** | **.0097** | **85** |
| **Hawkins** 131 | **All mfg.** | **6** | **6** | **121.3** | **.0063** | **100** |
| **Haywood** | **All mfg.** | **14** | **4** | **72.5** | **.0038** | **57** |
| **Henderson** | **All mfg.** | **13** | **8** | **187.3** | **.0097** | **84** |
| **Henry** | **All mfg.** | **20** | **12** | **280.5** | **.0146** | **92** |
| **Hickman** | **All mfg.** | **9** | **2** | **43.7** | **.0023** | **64** |
| **Houston** | **All mfg.** | **4** | **2** | **13.6** | **.0007** | **72** |
| **Humphreys** | **All mfg.** | **9** | **6** | **315.7** | **.0164** | **97** |
| **Jackson** | **All mfg.** | **5** | **3** | **44.6** | **.0023** | **79** |
| **Jefferson** | **All mfg.** | **16** | **5** | **172.3** | **.0089** | **89** |
| 2517 | Wood TV & radio cabinets | 1 | 1 | 73.7 | 18.0460 | 100 |
| **Johnson** | **All mfg.** | **7** | **4** | **152.8** | **.0079** | **95** |
| 2221 | Synthetics- & silk-weaving mills | 1 | 1 | 112.6 | 1.4708 | 100 |
| **Knox** 139 | **All mfg.** | **208** | **69** | **2,106.7** | **.1094** | **81** |
| 2311 | Men's & boys' suits & coats | 8 | 6 | 93.5 | 2.2720 | 98 |
| 2327 | Men's & boys' separate trousers | 2 | 2 | 55.2 | 2.2325 | 100 |
| 2399 | Fabricated textile products n.e.c. | 2 | 1 | 101.2 | 6.4984 | 98 |
| 3079 | Miscellaneous plastics products | 8 | 5 | 73.8 | .2702 | 90 |
| 3622 | Industrial controls | 1 | 1 | 60.4 | 1.7417 | 100 |
| 3823 | Industrial process-control instruments | 2 | 1 | 72.9 | 2.4877 | 97 |
| **Lake** | **All mfg.** | **9** | **3** | **105.7** | **.0055** | **30** |
| **Lauderdale** | **All mfg.** | **22** | **12** | **251.7** | **.0131** | **87** |
| 3079 | Miscellaneous plastics products | 3 | 2 | 76.3 | .2794 | 98 |
| **Lawrence** | **All mfg.** | **22** | **6** | **324.3** | **.0168** | **83** |
| 3524 | Lawn & garden equipment | 1 | 1 | 79.4 | 4.1555 | 100 |
| 3751 | Motorcycles, bicycles, & parts | 1 | 1 | 110.7 | 10.0545 | 100 |
| **Lewis** | **All mfg.** | **7** | **4** | **71.5** | **.0037** | **90** |
| **Lincoln** | **All mfg.** | **14** | **10** | **468.4** | **.0243** | **92** |
| 2335 | Women's & misses' dresses | 4 | 4 | 112.2 | 1.8308 | 100 |
| 3585 | Refrigeration & heating equipment | 1 | 1 | 252.3 | 1.2060 | 100 |
| **Loudon** | **All mfg.** | **14** | **9** | **275.6** | **.0143** | **94** |
| 3714 | Motor-vehicle parts & accessories | 1 | 1 | 99.2 | .2406 | 100 |
| **McMinn** | **All mfg.** | **41** | **25** | **528.3** | **.0274** | **93** |
| 2621 | Paper mills, except building paper | 1 | 1 | 168.7 | .8891 | 100 |
| **McNairy** | **All mfg.** | **18** | **14** | **207.2** | **.0108** | **96** |
| 2321 | Men's & boys' shirts & nightwear | 7 | 7 | 84.3 | 2.0180 | 100 |
| **Macon** | **All mfg.** | **14** | **5** | **104.9** | **.0054** | **76** |
| **Madison** | **All mfg.** | **64** | **22** | **783.7** | **.0407** | **83** |
| **Marion** 57 | **All mfg.** | **16** | **8** | **131.2** | **.0068** | **71** |
| **Marshall** | **All mfg.** | **24** | **11** | **357.2** | **.0185** | **86** |
| 3585 | Refrigeration & heating equipment | 2 | 1 | 195.1 | .9326 | 95 |
| 3952 | Lead pencils & art goods | 3 | 3 | 45.9 | 13.2659 | 100 |
| **Maury** | **All mfg.** | **47** | **13** | **637.4** | **.0331** | **67** |
| **Meigs** | **All mfg.** | **3** | **1** | **12.5** | **.0006** | **86** |
| **Monroe** | **All mfg.** | **18** | **5** | **90.2** | **.0047** | **63** |
| **Montgomery** 61 | **All mfg.** | **25** | **11** | **598.5** | **.0311** | **91** |
| 3143 | Men's nonathletic footwear | 1 | 1 | 43.5 | 1.7551 | 100 |
| 3585 | Refrigeration & heating equipment | 1 | 1 | 344.8 | 1.6482 | 100 |
| **Moore** | **All mfg.** | **2** | **1** | **53.7** | **.0028** | **96** |
| **Morgan** | **All mfg.** | **5** | **3** | **40.5** | **.0021** | **88** |
| **Obion** | **All mfg.** | **18** | **7** | **586.7** | **.0305** | **94** |
| 3011 | Tires & inner tubes | 1 | 1 | 351.8 | 3.2295 | 100 |
| **Overton** | **All mfg.** | **10** | **4** | **74.1** | **.0038** | **72** |
| 2321 | Men's & boys' shirts & nightwear | 2 | 2 | 45.2 | 1.0820 | 100 |
| **Perry** | **All mfg.** | **6** | **3** | **50.3** | **.0026** | **89** |
| **Pickett** | **All mfg.** | **6** | **3** | **30.0** | **.0016** | **74** |
| **Polk** | **All mfg.** | **6** | **3** | **151.7** | **.0079** | **93** |
| **Putnam** | **All mfg.** | **52** | **17** | **397.6** | **.0206** | **77** |
| **Rhea** | **All mfg.** | **16** | **11** | **210.1** | **.0109** | **95** |
| **Roane** | **All mfg.** | **14** | **6** | **194.7** | **.0101** | **87** |
| 2251 | Women's full- & knee-length hosiery | 2 | 2 | 41.9 | 3.9119 | 100 |
| **Robertson** 183 | **All mfg.** | **18** | **10** | **138.3** | **.0072** | **83** |
| **Rutherford** 183 | **All mfg.** | **54** | **24** | **734.6** | **.0381** | **88** |
| 3011 | Tires & inner tubes | 1 | 1 | 185.6 | 1.7038 | 100 |
| 3621 | Motors & generators | 1 | 1 | 56.0 | .8662 | 100 |
| **Scott** | **All mfg.** | **7** | **4** | **43.0** | **.0022** | **81** |
| **Sequatchie** 57 | **All mfg.** | **7** | **2** | **33.1** | **.0017** | **58** |
| **Sevier** | **All mfg.** | **16** | **5** | **111.7** | **.0058** | **72** |
| **Shelby** 172 | **All mfg.** | **474** | **135** | **6,649.7** | **.3453** | **81** |
| 2011 | Meat-packing plants | 6 | 5 | 455.8 | 1.0733 | 97 |
| 2051 | Bread, cake, & related products | 11 | 5 | 105.1 | .9162 | 88 |
| 2511 | Wood household furniture | 6 | 3 | 61.4 | 1.2041 | 92 |
| 2643 | Bags, except textile bags | 5 | 3 | 172.7 | 3.6145 | 93 |
| 2647 | Sanitary paper products | 2 | 1 | 284.6 | 4.2607 | 98 |
| 2711 | Newspapers | 5 | 1 | 67.2 | .3675 | 89 |
| 2819 | Industrial inorganic chemicals n.e.c. | 6 | 3 | 176.4 | 1.4196 | 93 |
| 2834 | Pharmaceutical preparations | 2 | 1 | 231.4 | 1.4082 | 98 |
| 3011 | Tires & inner tubes | 1 | 1 | 411.0 | 3.7730 | 100 |
| 3443 | Fabricated plate work (boiler shops) | 10 | 3 | 79.6 | .7980 | 69 |
| 3523 | Farm machinery & equipment | 5 | 2 | 236.9 | 1.9058 | 96 |
| 3641 | Electric lamps | 1 | 1 | 147.4 | 6.4224 | 100 |
| 3931 | Musical instruments & parts | 2 | 2 | 46.4 | 3.9126 | 100 |
| **Smith** | **All mfg.** | **6** | **3** | **95.1** | **.0049** | **91** |
| **Sullivan** 131 | **All mfg.** | **64** | **29** | **2,237.3** | **.1188** | **95** |
| 2621 | Paper mills, except building paper | 1 | 1 | 148.4 | .7821 | 100 |
| 2821 | Plastics materials & synthetic resins | 1 | 1 | 271.4 | 1.6591 | 100 |
| 2823 | Cellulosic man-made fibers | 1 | 1 | 459.2 | 26.8315 | 100 |
| 2869 | Industrial organic chemicals n.e.c. | 1 | 1 | 690.7 | 1.9871 | 100 |
| 3483 | Ammunition, except small-arms, n.e.c. | 2 | 1 | 53.8 | 5.6323 | 98 |
| 3662 | Radio & TV communication equipment | 1 | 1 | 154.5 | .6415 | 100 |
| **Sumner** 183 | **All mfg.** | **47** | **21** | **492.4** | **.0256** | **74** |
| **Tipton** 172 | **All mfg.** | **13** | **4** | **76.7** | **.0040** | **58** |
| **Trousdale** | **All mfg.** | **7** | **5** | **55.7** | **.0029** | **94** |
| **Unicoi** 131 | **All mfg.** | **8** | **6** | **143.2** | **.0074** | **94** |
| **Union** 139 | **All mfg.** | **5** | | **15.1** | **.0008** | **0** |
| **Van Buren** | **All mfg.** | **4** | **3** | **40.5** | **.0021** | **93** |
| **Warren** | **All mfg.** | **25** | **13** | **590.3** | **.0306** | **93** |
| 3585 | Refrigeration & heating equipment | 1 | 1 | 252.3 | 1.2060 | 100 |
| **Washington** 131 | **All mfg.** | **52** | **27** | **823.7** | **.0428** | **90** |
| 3661 | Telephone & telegraph apparatus | 1 | 1 | 166.1 | 1.2753 | 100 |
| **Wayne** | **All mfg.** | **11** | **8** | **88.0** | **.0046** | **96** |
| **Weakley** | **All mfg.** | **16** | **9** | **115.7** | **.0060** | **82** |
| **White** | **All mfg.** | **16** | **8** | **182.1** | **.0095** | **88** |
| **Williamson** 183 | **All mfg.** | **25** | **8** | **179.6** | **.0093** | **69** |
| **Wilson** 183 | **All mfg.** | **34** | **9** | **368.4** | **.0191** | **78** |
| 3714 | Motor-vehicle parts & accessories | 1 | 1 | 117.1 | .2840 | 100 |
| **State Total** | **All mfg.** | **2,859** | **1,126** | **40,295.0** | **2.0922** | **86** |
| **TEXAS** | | | | | | |
| **Anderson** | **All mfg.** | **18** | **6** | **486.3** | **.0252** | **32** |
| **Andrews** | **All mfg.** | **2** | **1** | **20.9** | **.0011** | **89** |
| **Angelina** | **All mfg.** | **37** | **18** | **506.2** | **.0263** | **84** |
| 3321 | Gray-iron foundries | 2 | 2 | 83.9 | .9840 | 100 |
| **Aransas** | **All mfg.** | **2** | **1** | **13.2** | **.0007** | **70** |
| **Armstrong** | **All mfg.** | **1** | | **3.0** | **.0002** | **0** |
| **Atascosa** | **All mfg.** | **2** | | **9.7** | **.0005** | **0** |
| **Austin** | **All mfg.** | **14** | **1** | **81.6** | **.0042** | **13** |
| **Bailey** | **All mfg.** | **1** | | **3.0** | **.0002** | **0** |
| **Bandera** | **All mfg.** | **1** | **1** | **6.9** | **.0004** | **100** |

DEFINITIONS—**SIC Industry:** Classification by plant's primary product. **N.E.C.:** Not elsewhere classified. **Metro Area Code:** Metro market that county belongs to; see list, page 59. **Total Plants:** 20 + employees. **Large Plants:** 100 + employees. **All mfg.:** Total for all plants with 20 + employees in the county. **Shipments:** Dollar value of all goods produced. **% Of U.S.:** Boldface refers to county's share of total U.S. shipments; lightface to the SIC industry in the county and its share of the industry's total U.S. shipments. **% In Large Plants:** Share of shipments (rounded) from plants with 100 + employees; if the share is 99.5% or more, it shows as 100%.

| County SIC | Metro Area Industry | Number Of Plants: Total Plants | Large Plants | Total Shipments ($ Mil) | % Of U.S. Shipments | % In Large Plants |
|---|---|---|---|---|---|---|
| **Bastrop** | **All mfg.** | **9** | **2** | **49.6** | **.0026** | **42** |
| **Baylor** | **All mfg.** | **2** | **1** | **8.1** | **.0004** | **65** |
| **Bee** | **All mfg.** | **4** | | **10.0** | **.0005** | **0** |
| **Bell** | **138 All mfg.** | **54** | **19** | **367.2** | **.0191** | **67** |
| 2531 | Public-building & related furniture | 4 | 4 | 44.1 | 4.5938 | 100 |
| 3079 | Miscellaneous plastics products | 5 | 4 | 68.3 | .2501 | 97 |
| **Bexar** | **247 All mfg.** | **325** | **111** | **3,818.4** | **.1983** | **74** |
| 2011 | Meat-packing plants | 10 | 7 | 624.3 | 1.4701 | 92 |
| 2051 | Bread, cake, & related products | 9 | 6 | 78.1 | .6809 | 92 |
| 2339 | Women's & misses' outerwear n.e.c. | 4 | 1 | 70.0 | 1.5382 | 86 |
| 2711 | Newspapers | 3 | 2 | 61.5 | .3363 | 97 |
| 3272 | Concrete products n.e.c. | 12 | 3 | 60.2 | 1.5977 | 57 |
| 3441 | Fabricated structural metal | 10 | 4 | 63.8 | .9156 | 77 |
| 3479 | Metal coating & allied services n.e.c. | 2 | 1 | 63.2 | 2.8587 | 95 |
| 3573 | Electronic computing equipment | 6 | 4 | 221.9 | .7594 | 96 |
| 3585 | Refrigeration & heating equipment | 4 | 3 | 231.4 | 1.1061 | 95 |
| **Blanco** | **All mfg.** | **1** | | **6.5** | **.0003** | **0** |
| **Bosque** | **All mfg.** | **9** | **4** | **61.0** | **.0032** | **70** |
| **Bowie** | **277 All mfg.** | **65** | **15** | **696.7** | **.0362** | **72** |
| 3011 | Tires & inner tubes | 1 | 1 | 198.8 | 1.8250 | 100 |
| **Brazoria** | **120 All mfg.** | **67** | **19** | **4,684.9** | **.2432** | **91** |
| 2812 | Alkalies & chlorine | 2 | 2 | 124.6 | 5.1379 | 100 |
| 2819 | Industrial inorganic chemicals n.e.c. | 5 | 2 | 189.5 | 1.5251 | 87 |
| 2821 | Plastics materials & synthetic resins | 3 | 2 | 226.2 | 1.3828 | 94 |
| 2869 | Industrial organic chemicals n.e.c. | 6 | 3 | 2,054.8 | 5.9115 | 97 |
| **Brazos** | **45 All mfg.** | **32** | **7** | **226.3** | **.0117** | **52** |
| **Brewster** | **All mfg.** | **1** | | **3.5** | **.0002** | **0** |
| **Brooks** | **All mfg.** | **1** | | **6.8** | **.0004** | **0** |
| **Brown** | **All mfg.** | **22** | **7** | **198.5** | **.0103** | **72** |
| **Burleson** | **All mfg.** | **3** | **2** | **18.8** | **.0010** | **80** |
| **Burnet** | **All mfg.** | **12** | | **22.5** | **.0012** | **0** |
| **Caldwell** | **All mfg.** | **9** | **2** | **47.5** | **.0025** | **32** |
| **Calhoun** | **All mfg.** | **12** | **3** | **231.9** | **.0120** | **80** |
| 3334 | Primary aluminum | 1 | 1 | 161.1 | 2.7476 | 100 |
| **Callahan** | **1 All mfg.** | **1** | | **2.4** | **.0001** | **0** |
| **Cameron** | **44 All mfg.** | **85** | **32** | **1,171.0** | **.0608** | **73** |
| 2328 | Men's & boys' work clothing | 2 | 2 | 72.6 | 1.3493 | 100 |
| 3533 | Oil-field machinery | 2 | 2 | 143.0 | 2.3306 | 100 |
| **Camp** | **All mfg.** | **6** | **1** | **72.0** | **.0037** | **76** |
| **Carson** | **All mfg.** | **1** | | **1.3** | **.0001** | **0** |
| **Cass** | **All mfg.** | **7** | **3** | **57.6** | **.0030** | **66** |
| **Castro** | **All mfg.** | **2** | **1** | **33.3** | **.0017** | **53** |
| **Chambers** | **All mfg.** | **3** | **1** | **409.6** | **.0213** | **64** |
| **Cherokee** | **All mfg.** | **42** | **10** | **291.4** | **.0151** | **55** |
| **Childress** | **All mfg.** | **3** | **2** | **27.0** | **.0014** | **93** |
| **Clay** | **297 All mfg.** | **2** | **1** | **9.5** | **.0005** | **92** |
| **Coleman** | **All mfg.** | **6** | **2** | **28.3** | **.0015** | **78** |
| **Collin** | **70 All mfg.** | **51** | **17** | **373.5** | **.0194** | **63** |
| **Collingsworth** | **All mfg.** | **1** | | **9.6** | **.0005** | **0** |
| **Colorado** | **All mfg.** | **13** | **4** | **77.4** | **.0040** | **69** |
| **Comal** | **247 All mfg.** | **19** | **12** | **264.1** | **.0137** | **89** |
| **Comanche** | **All mfg.** | **10** | **3** | **85.1** | **.0044** | **55** |
| **Cooke** | **All mfg.** | **24** | **7** | **205.4** | **.0107** | **65** |
| **Coryell** | **138 All mfg.** | **5** | | **15.5** | **.0008** | **0** |
| **Crane** | **All mfg.** | **3** | | **9.7** | **.0005** | **0** |
| **Crockett** | **All mfg.** | **1** | | **4.4** | **.0002** | **0** |
| **Crosby** | **All mfg.** | **1** | | **2.7** | **.0001** | **0** |
| **Culberson** | **All mfg.** | **1** | | **1.2** | **.0001** | **0** |
| **Dallam** | **All mfg.** | **1** | | **4.1** | **.0002** | **0** |
| **Dallas** | **70 All mfg.** | **1,173** | **339** | **11,887.9** | **.6172** | **73** |
| 2013 | Sausages & other prepared meats | 10 | 3 | 160.6 | 1.3586 | 68 |
| 2051 | Bread, cake, & related products | 11 | 5 | 110.3 | .9616 | 84 |
| 2086 | Bottled & canned soft drinks | 8 | 2 | 119.1 | .8098 | 68 |
| 2099 | Food preparations n.e.c. | 11 | 4 | 133.7 | 1.6223 | 72 |
| 2327 | Men's & boys' separate trousers | 2 | 1 | 92.6 | 3.7450 | 98 |
| 2335 | Women's & misses' dresses | 32 | 18 | 317.7 | 5.1840 | 88 |
| 2642 | Envelopes | 9 | 7 | 64.1 | 4.7718 | 90 |
| 2653 | Corrugated & solid fiber boxes | 19 | 9 | 173.7 | 1.6778 | 68 |
| 2711 | Newspapers | 12 | 4 | 169.5 | .9270 | 85 |
| 2731 | Book publishing | 5 | 2 | 109.0 | 1.5741 | 92 |
| 2751 | Letterpress commercial printing | 39 | 8 | 99.5 | 1.6204 | 57 |
| 2841 | Soap & other detergents | 9 | 1 | 250.6 | 3.1796 | 64 |
| 2851 | Paints & allied products | 16 | 4 | 187.2 | 1.8498 | 61 |
| 3079 | Miscellaneous plastics products | 50 | 11 | 282.7 | 1.0350 | 62 |
| 3443 | Fabricated plate work (boiler shops) | 17 | 5 | 126.8 | 1.2711 | 66 |
| 3444 | Sheet-metal work | 34 | 3 | 129.9 | 2.0022 | 44 |
| 3532 | Mining machinery | 5 | 3 | 125.1 | 3.5727 | 93 |
| 3533 | Oil-field machinery | 10 | 8 | 415.9 | 6.7788 | 98 |
| 3559 | Special-industry machinery n.e.c. | 7 | 2 | 123.8 | 1.6147 | 82 |
| 3573 | Electronic computing equipment | 16 | 8 | 477.7 | 1.6349 | 90 |
| 3585 | Refrigeration & heating equipment | 11 | 4 | 665.6 | 3.1817 | 92 |
| 3661 | Telephone & telegraph apparatus | 8 | 4 | 237.0 | 1.8197 | 92 |
| 3662 | Radio & TV communication equipment | 30 | 10 | 377.4 | 1.5671 | 80 |
| 3674 | Semiconductors & related devices | 9 | 6 | 637.7 | 6.7713 | 98 |
| 3679 | Electronic components n.e.c. | 13 | 2 | 88.4 | .9324 | 77 |
| 3691 | Storage batteries | 6 | 5 | 100.2 | 3.6173 | 97 |
| 3714 | Motor-vehicle parts & accessories | 11 | 9 | 178.6 | .4332 | 97 |
| 3721 | Aircraft | 4 | 3 | 241.3 | .9686 | 97 |
| 3728 | Aircraft equipment n.e.c. | 7 | 6 | 92.6 | 1.1559 | 98 |
| **Dawson** | **All mfg.** | **5** | **2** | **32.5** | **.0017** | **51** |
| **Deaf Smith** | **All mfg.** | **17** | **1** | **130.5** | **.0068** | **40** |
| **Delta** | **All mfg.** | **1** | | **2.3** | **.0001** | **0** |
| **Denton** | **70 All mfg.** | **48** | **19** | **340.6** | **.0177** | **64** |
| **De Witt** | **All mfg.** | **7** | **2** | **47.8** | **.0025** | **42** |
| **Dickens** | **All mfg.** | **2** | | **4.6** | **.0002** | **0** |
| **Dimmit** | **All mfg.** | **2** | **1** | **152.2** | **.0079** | **7** |
| **Donley** | **All mfg.** | **1** | | **1.5** | **.0001** | **0** |
| **Duval** | **All mfg.** | **1** | | **6.0** | **.0003** | **0** |
| **Eastland** | **All mfg.** | **16** | **3** | **116.3** | **.0060** | **71** |
| **Ector** | **198 All mfg.** | **86** | **13** | **675.2** | **.0351** | **61** |
| 3533 | Oil-field machinery | 14 | 4 | 115.5 | 1.8825 | 61 |
| **Edwards** | **All mfg.** | **1** | | **3.0** | **.0002** | **0** |
| **Ellis** | **70 All mfg.** | **53** | **19** | **467.4** | **.0243** | **74** |
| **El Paso** | **84 All mfg.** | **181** | **85** | **3,327.9** | **.1728** | **91** |
| 2321 | Men's & boys' shirts & nightwear | 5 | 5 | 67.6 | 1.6183 | 100 |
| 2327 | Men's & boys' separate trousers | 15 | 14 | 209.3 | 8.4648 | 100 |
| 2328 | Men's & boys' work clothing | 10 | 8 | 269.6 | 5.0107 | 97 |
| 3143 | Men's nonathletic footwear | 6 | 4 | 59.1 | 2.3845 | 92 |
| 3331 | Primary copper | 2 | 2 | 323.6 | 6.7508 | 100 |
| 3444 | Sheet-metal work | 7 | 4 | 53.7 | .8277 | 90 |
| **Erath** | **All mfg.** | **8** | **4** | **64.4** | **.0033** | **72** |
| **Falls** | **All mfg.** | **7** | **2** | **67.9** | **.0035** | **82** |
| **Fannin** | **All mfg.** | **13** | **6** | **217.7** | **.0113** | **93** |
| **Fayette** | **All mfg.** | **12** | **2** | **79.7** | **.0041** | **30** |
| **Fisher** | **All mfg.** | **1** | **1** | **18.2** | **.0009** | **100** |
| **Floyd** | **All mfg.** | **2** | | **13.1** | **.0007** | **0** |
| **Foard** | **All mfg.** | **1** | | **.9** | **.0000** | **0** |
| **Fort Bend** | **120 All mfg.** | **44** | **19** | **1,046.9** | **.0544** | **89** |
| 3494 | Valves & pipe fittings | 3 | 2 | 76.9 | .9861 | 93 |
| 3573 | Electronic computing equipment | 2 | 1 | 443.1 | 1.5165 | 98 |
| **Franklin** | **All mfg.** | **3** | **1** | **13.6** | **.0007** | **69** |
| **Freestone** | **All mfg.** | **4** | | **13.2** | **.0007** | **0** |
| **Frio** | **All mfg.** | **1** | | **4.0** | **.0002** | **0** |
| **Gaines** | **All mfg.** | **1** | | **3.5** | **.0002** | **0** |
| **Galveston** | **104 All mfg.** | **51** | **19** | **7,204.0** | **.3740** | **98** |
| 2821 | Plastics materials & synthetic resins | 2 | 2 | 361.8 | 2.2118 | 100 |
| 2869 | Industrial organic chemicals n.e.c. | 3 | 3 | 1,114.1 | 3.2052 | 100 |
| 2911 | Petroleum refining | 3 | 3 | 5,093.0 | 2.9002 | 100 |
| 3731 | Ship building & repairing | 4 | 3 | 148.4 | 1.2409 | 98 |
| **Gillespie** | **All mfg.** | **8** | **1** | **57.4** | **.0030** | **38** |
| **Gonzales** | **All mfg.** | **9** | **5** | **116.7** | **.0061** | **46** |
| **Gray** | **All mfg.** | **11** | **4** | **243.3** | **.0126** | **87** |
| **Grayson** | **259 All mfg.** | **57** | **29** | **1,136.9** | **.0590** | **87** |
| 3674 | Semiconductors & related devices | 1 | 1 | 166.8 | 1.7711 | 100 |
| 3842 | Surgical appliances & supplies | 1 | 1 | 74.8 | 1.6046 | 100 |
| **Gregg** | **159 All mfg.** | **92** | **27** | **1,291.3** | **.0670** | **69** |
| 2869 | Industrial organic chemicals n.e.c. | 1 | 1 | 317.0 | .9120 | 100 |
| 3532 | Mining machinery | 1 | 1 | 80.1 | 2.2875 | 100 |
| **Grimes** | **All mfg.** | **9** | **4** | **66.4** | **.0034** | **75** |
| **Guadalupe** | **247 All mfg.** | **17** | **5** | **222.6** | **.0116** | **84** |
| 3651 | Radio & TV receiving sets | 1 | 1 | 111.6 | 1.2901 | 100 |
| **Hale** | **All mfg.** | **24** | **5** | **410.7** | **.0213** | **65** |
| **Hamilton** | **All mfg.** | **5** | **1** | **18.5** | **.0010** | **40** |
| **Hardeman** | **All mfg.** | **3** | **2** | **49.4** | **.0026** | **96** |

| County SIC | Metro Area Industry | Number Of Plants: Total Plants | Number Of Plants: Large Plants | 1981 (S&MM Est.): Total Shipments ($ Mil.) | 1981 (S&MM Est.): % Of U.S. Shipments | 1981 (S&MM Est.): % In Large Plants |
|---|---|---|---|---|---|---|
| **TEXAS** (cont.) | | | | | | |
| **Hardin** | **29 All mfg.** | **10** | **4** | **546.1** | **.0284** | **71** |
| 2421 | General sawmills & planing mills | 5 | 2 | 94.1 | .6931 | 84 |
| 2631 | Paperboard mills | 1 | 1 | 261.8 | 2.4456 | 100 |
| **Harris** | **120 All mfg.** | **1,432** | **404** | **29,086.1** | **1.5102** | **85** |
| 2044 | Rice milling | 5 | 5 | 667.0 | 41.2594 | 100 |
| 2051 | Bread, cake, & related products | 9 | 5 | 100.6 | .8770 | 87 |
| 2095 | Roasted coffee | 3 | 3 | 563.4 | 7.7177 | 100 |
| 2611 | Pulp mills | 1 | 1 | 134.5 | 4.3153 | 100 |
| 2621 | Paper mills, except building paper | 2 | 2 | 269.8 | 1.4219 | 100 |
| 2653 | Corrugated & solid fiber boxes | 11 | 5 | 114.3 | 1.1040 | 71 |
| 2711 | Newspapers | 8 | 3 | 165.1 | .9029 | 91 |
| 2751 | Letterpress commercial printing | 32 | 9 | 101.4 | 1.6514 | 69 |
| 2812 | Alkalies & chlorine | 8 | 5 | 359.7 | 14.8324 | 97 |
| 2813 | Industrial gases | 15 | 1 | 115.0 | 6.2735 | 56 |
| 2819 | Industrial inorganic chemicals n.e.c. | 16 | 6 | 275.6 | 2.2180 | 79 |
| 2821 | Plastics materials & synthetic resins | 21 | 15 | 1,082.6 | 6.6182 | 95 |
| 2822 | Synthetic rubber | 3 | 3 | 278.4 | 9.[illegible]4 | 100 |
| 2851 | Paints & allied products | 22 | 2 | 204.1 | 2.0168 | 28 |
| 2865 | Cyclic crudes & intermediates | 11 | 4 | 494.1 | 6.3223 | 79 |
| 2869 | Industrial organic chemicals n.e.c. | 28 | 11 | 1,901.9 | 5.4717 | 85 |
| 2899 | Chemical preparations n.e.c. | 20 | 2 | 195.2 | 3.0740 | 47 |
| 2911 | Petroleum refining | 8 | 5 | 10,503.7 | 5.9813 | 98 |
| 3079 | Miscellaneous plastics products | 58 | 10 | 276.3 | 1.0116 | 52 |
| 3273 | Ready-mixed concrete | 21 | 1 | 117.7 | 1.3027 | 10 |
| 3293 | Gaskets, packing, & sealing devices | 13 | 3 | 71.9 | 3.8208 | 61 |
| 3312 | Blast furnaces & steel mills | 3 | 2 | 756.1 | 1.3231 | 99 |
| 3317 | Steel pipe & tubes | 16 | 8 | 201.8 | 5.5757 | 90 |
| 3411 | Metal cans | 5 | 4 | 215.1 | 2.5137 | 98 |
| 3441 | Fabricated structural metal | 28 | 9 | 192.2 | 2.7584 | 77 |
| 3443 | Fabricated plate work (boiler shops) | 53 | 19 | 478.4 | 4.7958 | 77 |
| 3444 | Sheet-metal work | 32 | 8 | 146.6 | 2.2596 | 56 |
| 3448 | Prefabricated metal buildings | 17 | 10 | 271.5 | 10.9839 | 91 |
| 3449 | Miscellaneous metal work | 15 | 5 | 84.7 | 4.9730 | 69 |
| 3452 | Bolts, nuts, rivets, & washers | 13 | 4 | 91.0 | 2.0528 | 67 |
| 3462 | Iron & steel forgings | 6 | 3 | 109.6 | 2.7736 | 86 |
| 3463 | Nonferrous forgings | 1 | 1 | 133.3 | 20.1878 | 100 |
| 3479 | Metal coating & allied services n.e.c. | 16 | 5 | 161.5 | 7.3050 | 82 |
| 3494 | Valves & pipe fittings | 67 | 22 | 713.2 | 9.1453 | 76 |
| 3496 | Miscellaneous fabricated wire products | 14 | 3 | 33.8 | 1.6792 | 52 |
| 3498 | Fabricated pipe & fittings | 20 | 5 | 188.8 | 7.8673 | 67 |
| 3519 | Internal-combustion engines n.e.c. | 4 | 2 | 151.3 | 1.3226 | 89 |
| 3533 | Oil-field machinery | 70 | 31 | 1,683.7 | 27.4428 | 90 |
| 3536 | Hoists, industrial cranes, & monorails | 6 | 4 | 80.7 | 5.8263 | 96 |
| 3561 | Pumps & pumping equipment | 13 | 3 | 59.5 | 1.4969 | 56 |
| 3564 | Blowers & exhaust & ventilation fans | 10 | 3 | 39.8 | 2.6892 | 66 |
| 3573 | Electronic computing equipment | 5 | 3 | 179.0 | .6126 | 96 |
| 3599 | Machinery, except electrical, n.e.c. | 42 | 4 | 185.1 | 1.3878 | 33 |
| 3662 | Radio & TV communication equipment | 9 | 3 | 106.1 | .4405 | 77 |
| 3674 | Semiconductors & related devices | 1 | 1 | 166.8 | 1.7711 | 100 |
| 3731 | Ship building & repairing | 12 | 5 | 171.2 | 1.4315 | 86 |
| 3811 | Engineering & scientific instruments | 8 | 3 | 85.0 | 2.4852 | 85 |
| 3823 | Industrial process-control instruments | 17 | 4 | 77.1 | 2.6310 | 59 |
| **Harrison** | **159 All mfg.** | **38** | **10** | **354.5** | **.0184** | **67** |
| 3483 | Ammunition, except small-arms, n.e.c. | 2 | 1 | 43.3 | 4.5331 | 97 |
| **Hays** | **22 All mfg.** | **17** | **3** | **99.9** | **.0052** | **40** |
| **Hemphill** | **All mfg.** | **1** | | **4.3** | **.0002** | **0** |
| **Henderson** | **All mfg.** | **14** | **5** | **141.7** | **.0074** | **86** |
| **Hidalgo** | **165 All mfg.** | **70** | **27** | **726.6** | **.0377** | **74** |
| 2033 | Canned fruits & vegetables | 8 | 7 | 105.0 | 1.3187 | 98 |
| 2327 | Men's & boys' separate trousers | 2 | 2 | 38.8 | 1.5692 | 100 |
| **Hill** | **All mfg.** | **14** | **5** | **112.9** | **.0059** | **70** |
| **Hockley** | **All mfg.** | **4** | | **24.4** | **.0013** | **0** |
| **Hood** | **70 All mfg.** | **4** | | **37.3** | **.0019** | **0** |
| **Hopkins** | **All mfg.** | **17** | **5** | **207.5** | **.0108** | **54** |
| **Houston** | **All mfg.** | **19** | **7** | **302.1** | **.0157** | **82** |
| 2621 | Paper mills, except building paper | 1 | 1 | 48.4 | .7821 | 100 |
| **Howard** | **All mfg.** | **24** | **6** | **1,041.2** | **.0541** | **94** |
| **Hunt** | **All mfg.** | **32** | **17** | **592.4** | **.0308** | **91** |
| 2341 | Women's & children's underwear | 4 | 3 | 71.9 | 2.7855 | 99 |
| 3721 | Aircraft | 2 | 2 | 233.9 | .9389 | 100 |
| **Hutchinson** | **All mfg.** | **17** | **5** | **771.2** | **.0400** | **91** |
| **Jack** | **All mfg.** | **4** | | **9.0** | **.0005** | **0** |
| **Jasper** | **All mfg.** | **11** | **5** | **127.3** | **.0066** | **89** |
| **Jefferson** | **29 All mfg.** | **107** | **47** | **19,984.7** | **1.0376** | **99** |
| 2822 | Synthetic rubber | 3 | 3 | 181.8 | 6.3378 | 100 |
| 2869 | Industrial organic chemicals n.e.c. | 10 | 7 | 1,193.7 | 3.4342 | 97 |
| 2911 | Petroleum refining | 6 | 6 | 17,522.8 | 9.9784 | 100 |
| 3731 | Ship building & repairing | 2 | 2 | 180.7 | 1.5110 | 100 |
| **Jim Wells** | **All mfg.** | **11** | **2** | **78.0** | **.0040** | **18** |
| **Johnson** | **70 All mfg.** | **42** | **13** | **321.6** | **.0167** | **76** |
| **Jones** | **1 All mfg.** | **5** | **2** | **45.5** | **.0024** | **36** |
| **Karnes** | **All mfg.** | **6** | **1** | **48.0** | **.0025** | **48** |
| **Kaufman** | **70 All mfg.** | **25** | **9** | **130.3** | **.0068** | **64** |
| **Kendall** | **All mfg.** | **2** | **1** | **15.2** | **.0008** | **73** |
| **Kerr** | **All mfg.** | **11** | **4** | **87.1** | **.0045** | **81** |
| **Kimble** | **All mfg.** | **2** | **1** | **16.2** | **.0008** | **46** |
| **Kleberg** | **All mfg.** | **3** | **1** | **27.8** | **.0014** | **79** |
| **Lamar** | **All mfg.** | **24** | **12** | **443.4** | **.0230** | **88** |
| **Lamb** | **All mfg.** | **2** | **1** | **27.1** | **.0014** | **96** |
| **Lampasas** | **All mfg.** | **5** | **3** | **34.7** | **.0018** | **73** |
| **Lavaca** | **All mfg.** | **24** | **8** | **169.0** | **.0088** | **39** |
| **Lee** | **All mfg.** | **3** | **1** | **21.7** | **.0011** | **60** |
| **Leon** | **All mfg.** | **3** | **2** | **75.9** | **.0039** | **93** |
| **Liberty** | **120 All mfg.** | **16** | **4** | **192.5** | **.0100** | **72** |
| **Limestone** | **All mfg.** | **9** | **5** | **56.3** | **.0029** | **77** |
| **Live Oak** | **All mfg.** | **3** | | **149.4** | **.0078** | **0** |
| **Llano** | **All mfg.** | **1** | | **1.4** | **.0001** | **0** |
| **Lubbock** | **163 All mfg.** | **96** | **27** | **1,056.3** | **.0548** | **76** |
| 3531 | Construction machinery | 3 | 2 | 144.4 | .7025 | 93 |
| 3873 | Watches, clocks, & watchcases | 1 | 1 | 71.7 | 3.4093 | 100 |
| **McCulloch** | **All mfg.** | **8** | **1** | **32.5** | **.0017** | **53** |
| **McLennan** | **290 All mfg.** | **134** | **46** | **1,262.1** | **.0655** | **77** |
| 3011 | Tires & inner tubes | 1 | 1 | 189.3 | 1.7378 | 100 |
| 3221 | Glass containers | 1 | 1 | 84.4 | 2.3203 | 100 |
| **Madison** | **All mfg.** | **3** | **2** | **20.6** | **.0011** | **89** |
| **Marion** | **All mfg.** | **4** | | **13.3** | **.0007** | **0** |
| **Martin** | **All mfg.** | **1** | | **3.5** | **.0002** | **0** |
| **Matagorda** | **All mfg.** | **7** | **3** | **186.9** | **.0097** | **90** |
| **Maverick** | **All mfg.** | **8** | **5** | **120.5** | **.0063** | **79** |
| 2328 | Men's & boys' work clothing | 4 | 4 | 85.1 | 1.5816 | 100 |
| **Medina** | **All mfg.** | **5** | **3** | **67.7** | **.0035** | **83** |
| **Midland** | **174 All mfg.** | **25** | **9** | **256.0** | **.0133** | **84** |
| 3574 | Calculating & accounting machines | 1 | 1 | 86.3 | 4.5873 | 100 |
| **Milam** | **All mfg.** | **11** | **4** | **295.5** | **.0153** | **89** |
| 3334 | Primary aluminum | 1 | 1 | 241.5 | 4.1188 | 100 |
| **Mills** | **All mfg.** | **2** | | **4.0** | **.0002** | **0** |
| **Mitchell** | **All mfg.** | **1** | **1** | **9.4** | **.0005** | **100** |
| **Montague** | **All mfg.** | **17** | **6** | **68.7** | **.0036** | **57** |
| **Montgomery** | **120 All mfg.** | **29** | **5** | **211.4** | **.0110** | **47** |
| **Moore** | **All mfg.** | **12** | **3** | **685.3** | **.0356** | **90** |
| **Morris** | **All mfg.** | **13** | **2** | **718.1** | **.0373** | **94** |
| 3312 | Blast furnaces & steel mills | 1 | 1 | 662.1 | 1.1586 | 100 |
| **Nacogdoches** | **All mfg.** | **22** | **10** | **269.5** | **.0140** | **79** |
| **Navarro** | **All mfg.** | **30** | **10** | **244.8** | **.0127** | **66** |
| **Newton** | **All mfg.** | **4** | **1** | **105.6** | **.0055** | **88** |
| **Nolan** | **All mfg.** | **14** | **7** | **216.1** | **.0112** | **87** |
| **Nueces** | **68 All mfg.** | **87** | **26** | **4,033.0** | **.2094** | **88** |
| 2911 | Petroleum refining | 8 | 5 | 3,193.1 | 1.8183 | 92 |
| **Ochiltree** | **All mfg.** | **2** | **1** | **42.1** | **.0022** | **92** |
| **Orange** | **29 All mfg.** | **36** | **11** | **1,232.2** | **.0640** | **88** |
| 2821 | Plastics materials & synthetic resins | 4 | 2 | 509.0 | 3.1117 | 96 |
| 2822 | Synthetic rubber | 3 | 2 | 168.1 | 5.8602 | 97 |
| 3317 | Steel pipe & tubes | 1 | 1 | 93.9 | 2.5944 | 100 |
| 3731 | Ship building & repairing | 3 | 1 | 195.1 | 1.6314 | 94 |

DEFINITIONS—**SIC Industry:** Classification by plant's primary product. **N.E.C.:** Not elsewhere classified. **Metro Area Code:** Metro market that county belongs to; see list, page 59. **Total Plants:** 20+ employees. **Large Plants:** 100+ employees. **All mfg.:** Total for all plants with 20+ employees in the county. **Shipments:** Dollar value of all goods produced. **% Of U.S.:** Boldface refers to county's share of total U.S. shipments; lightface to the SIC industry in the county and its share of the industry's total U.S. shipments. **% In Large Plants:** Share of shipments (rounded) from plants with 100+ employees; if the share is 99.5% or more, it shows as 100%.

| County / SIC | Metro Area / Industry | Number Of Plants: Total Plants | Large Plants | Total Shipments ($ Mil.) | % Of U.S. Shipments | % In Large Plants |
|---|---|---|---|---|---|---|
| **Palo Pinto** | **All mfg.** | **24** | **8** | **122.5** | **.0064** | **67** |
| **Panola** | **All mfg.** | **8** | **5** | **74.8** | **.0039** | **85** |
| **Parker** 70 | **All mfg.** | **15** | **2** | **62.6** | **.0033** | **34** |
| **Parmer** | **All mfg.** | **5** | **1** | **189.3** | **.0098** | **83** |
| **Pecos** | **All mfg.** | **1** | | **2.4** | **.0001** | **0** |
| **Polk** | **All mfg.** | **6** | **5** | **107.2** | **.0056** | **94** |
| **Potter** 9 | **All mfg.** | **76** | **17** | **1,465.0** | **.0761** | **85** |
| 2011 Meat-packing plants | | 3 | 1 | 494.0 | 1.1633 | 91 |
| 3489 Ordnance & accessories n.e.c. | | 1 | 1 | 114.0 | 12.3550 | 100 |
| **Rains** | **All mfg.** | **3** | | **8.5** | **.0004** | **0** |
| **Randall** 9 | **All mfg.** | **5** | **1** | **49.8** | **.0026** | **34** |
| **Red River** | **All mfg.** | **10** | **5** | **67.0** | **.0035** | **79** |
| **Reeves** | **All mfg.** | **2** | | **16.0** | **.0008** | **0** |
| **Robertson** | **All mfg.** | **7** | **1** | **81.5** | **.0042** | **13** |
| **Rockwall** 70 | **All mfg.** | **3** | **1** | **60.5** | **.0031** | **89** |
| **Runnels** | **All mfg.** | **10** | **1** | **119.2** | **.0062** | **21** |
| **Rusk** | **All mfg.** | **22** | **4** | **166.5** | **.0086** | **30** |
| **Sabine** | **All mfg.** | **1** | **1** | **20.2** | **.0010** | **100** |
| **San Augustine** | **All mfg.** | **2** | | **8.0** | **.0004** | **0** |
| **San Patricio** 68 | **All mfg.** | **20** | **6** | **373.3** | **.0194** | **36** |
| **San Saba** | **All mfg.** | **2** | | **4.8** | **.0002** | **0** |
| **Scurry** | **All mfg.** | **8** | **3** | **54.2** | **.0028** | **67** |
| **Shackelford** | **All mfg.** | **2** | | **6.7** | **.0003** | **0** |
| **Shelby** | **All mfg.** | **12** | **4** | **226.1** | **.0117** | **88** |
| **Sherman** | **All mfg.** | **2** | | **9.6** | **.0005** | **0** |
| **Smith** 284 | **All mfg.** | **67** | **19** | **1,942.0** | **.1008** | **91** |
| 3011 Tires & inner tubes | | 2 | 2 | 421.0 | 3.8648 | 100 |
| 3321 Gray-iron foundries | | 1 | 1 | 142.1 | 1.6666 | 100 |
| 3585 Refrigeration & heating equipment | | 2 | 2 | 546.7 | 2.6133 | 100 |
| **Stephens** | **All mfg.** | **7** | **2** | **56.2** | **.0029** | **64** |
| **Swisher** | **All mfg.** | **6** | **1** | **34.6** | **.0018** | **24** |
| **Tarrant** 70 | **All mfg.** | **636** | **171** | **8,359.7** | **.4340** | **76** |
| 2451 Mobile homes | | 10 | 5 | 110.2 | 2.9968 | 81 |
| 2711 Newspapers | | 8 | 4 | 112.9 | .6174 | 88 |
| 3069 Fabricated rubber products n.e.c. | | 11 | 3 | 53.1 | 1.0834 | 72 |
| 3079 Miscellaneous plastics products | | 35 | 9 | 190.1 | .6960 | 55 |
| 3325 Steel foundries n.e.c. | | 1 | 1 | 88.1 | 3.2417 | 100 |
| 3441 Fabricated structural metal | | 13 | 5 | 58.1 | .8338 | 64 |
| 3444 Sheet-metal work | | 20 | 4 | 72.9 | 1.1236 | 43 |
| 3483 Ammunition, except small-arms, n.e.c. | | 1 | 1 | 50.4 | 5.2764 | 100 |
| 3585 Refrigeration & heating equipment | | 18 | 5 | 441.6 | 2.1109 | 76 |
| 3662 Radio & TV communication equipment | | 4 | 2 | 159.4 | .6619 | 94 |
| 3679 Electronic components n.e.c. | | 7 | 3 | 42.4 | .4472 | 85 |
| 3711 Motor vehicles & passenger-car bodies | | 3 | 1 | 1,359.9 | 1.5478 | 98 |
| 3714 Motor-vehicle parts & accessories | | 7 | 1 | 106.1 | .2573 | 70 |
| 3721 Aircraft | | 4 | 3 | 1,526.8 | 6.1285 | 100 |
| 3728 Aircraft equipment n.e.c. | | 7 | 5 | 91.5 | 1.1421 | 93 |
| **Taylor** 1 | **All mfg.** | **58** | **14** | **667.0** | **.0346** | **45** |
| **Terry** | **All mfg.** | **4** | **1** | **62.5** | **.0032** | **79** |
| **Titus** | **All mfg.** | **8** | **3** | **207.2** | **.0108** | **26** |
| **Tom Green** 246 | **All mfg.** | **32** | **12** | **381.2** | **.0198** | **72** |
| 3842 Surgical appliances & supplies | | 1 | 1 | 74.8 | 1.6046 | 100 |
| **Travis** 22 | **All mfg.** | **156** | **25** | **1,816.5** | **.0943** | **74** |
| 3572 Typewriters | | 1 | 1 | 467.9 | 15.0663 | 100 |
| 3573 Electronic computing equipment | | 3 | 1 | 323.5 | 1.1072 | 96 |
| 3662 Radio & TV communication equipment | | 7 | 3 | 134.7 | .5593 | 85 |
| 3674 Semiconductors & related devices | | 2 | 2 | 95.1 | 1.0098 | 100 |
| **Trinity** | **All mfg.** | **5** | **1** | **158.8** | **.0082** | **7** |
| **Tyler** | **All mfg.** | **10** | **1** | **81.9** | **.0043** | **23** |
| **Upshur** | **All mfg.** | **5** | **2** | **40.3** | **.0021** | **49** |
| **Uvalde** | **All mfg.** | **8** | **2** | **42.9** | **.0022** | **37** |
| **Val Verde** | **All mfg.** | **6** | **2** | **114.8** | **.0060** | **91** |
| **Van Zandt** | **All mfg.** | **9** | **3** | **65.6** | **.0034** | **67** |
| **Victoria** 287 | **All mfg.** | **19** | **6** | **317.4** | **.0165** | **84** |
| 2821 Plastics materials & synthetic resins | | 1 | 1 | 199.0 | 1.2165 | 100 |
| **Walker** | **All mfg.** | **9** | | **26.6** | **.0014** | **0** |
| **Waller** 120 | **All mfg.** | **1** | | **8.8** | **.0005** | **0** |
| **Ward** | **All mfg.** | **1** | | **5.8** | **.0003** | **0** |
| **Washington** | **All mfg.** | **19** | **4** | **76.3** | **.0040** | **52** |
| **Webb** 148 | **All mfg.** | **25** | **8** | **212.1** | **.0110** | **66** |
| **Wharton** | **All mfg.** | **11** | **4** | **78.4** | **.0041** | **60** |
| **Wheeler** | **All mfg.** | **1** | | **14.8** | **.0008** | **0** |
| **Wichita** 297 | **All mfg.** | **70** | **27** | **797.6** | **.0414** | **78** |
| 3211 Flat glass | | 1 | 1 | 82.5 | 3.5693 | 100 |
| **Wilbarger** | **All mfg.** | **6** | **3** | **52.9** | **.0027** | **55** |
| **Willacy** | **All mfg.** | **6** | **2** | **35.7** | **.0019** | **49** |
| **Williamson** 22 | **All mfg.** | **38** | **10** | **279.5** | **.0145** | **65** |
| **Wilson** | **All mfg.** | **3** | **1** | **15.9** | **.0008** | **52** |
| **Winkler** | **All mfg.** | **2** | | **3.4** | **.0002** | **0** |
| **Wise** 70 | **All mfg.** | **14** | **2** | **46.2** | **.0024** | **23** |
| **Wood** | **All mfg.** | **8** | **3** | **79.2** | **.0041** | **59** |
| **Yoakum** | **All mfg.** | **1** | | **6.1** | **.0003** | **0** |
| **Young** | **All mfg.** | **11** | **5** | **85.2** | **.0044** | **62** |
| **Zavala** | **All mfg.** | **1** | **1** | **51.6** | **.0027** | **100** |
| **State Total** | **All mfg.** | **7,083** | **2,140** | **131,087.2** | **6.8062** | **83** |

## UTAH

| | | | | | | |
|---|---|---|---|---|---|---|
| **Beaver** | **All mfg.** | **1** | | **2.2** | **.0001** | **0** |
| **Box Elder** | **All mfg.** | **14** | **6** | **285.0** | **.0148** | **93** |
| 3724 Aircraft engines & engine parts | | 1 | 1 | 186.3 | 1.5766 | 100 |
| **Cache** | **All mfg.** | **33** | **12** | **760.7** | **.0395** | **83** |
| 2022 Natural & processed cheese | | 5 | 3 | 365.4 | 3.7934 | 90 |
| **Carbon** | **All mfg.** | **4** | **2** | **17.3** | **.0009** | **77** |
| **Davis** 245 | **All mfg.** | **51** | **15** | **952.8** | **.0495** | **49** |
| **Duchesne** | **All mfg.** | **3** | | **7.2** | **.0004** | **0** |
| **Emery** | **All mfg.** | **1** | | **5.5** | **.0003** | **0** |
| **Garfield** | **All mfg.** | **1** | **1** | **17.5** | **.0009** | **100** |
| **Grand** | **All mfg.** | **2** | **1** | **15.8** | **.0008** | **91** |
| **Iron** | **All mfg.** | **6** | **1** | **43.5** | **.0023** | **30** |
| **Juab** | **All mfg.** | **5** | **3** | **38.2** | **.0020** | **92** |
| **Kane** | **All mfg.** | **1** | | **3.6** | **.0002** | **0** |
| **Millard** | **All mfg.** | **4** | | **13.0** | **.0007** | **0** |
| **Morgan** | **All mfg.** | **4** | **1** | **33.1** | **.0017** | **76** |
| **Piute** | **All mfg.** | **1** | **1** | **10.4** | **.0005** | **100** |
| **Rich** | **All mfg.** | **1** | | **6.0** | **.0003** | **0** |
| **Salt Lake** 245 | **All mfg.** | **428** | **99** | **6,016.8** | **.3124** | **79** |
| 2026 Fluid milk | | 7 | 4 | 224.9 | 1.2489 | 89 |
| 2331 Women's & misses' blouses | | 2 | 2 | 68.8 | 2.0756 | 100 |
| 2711 Newspapers | | 4 | 3 | 69.5 | .3801 | 94 |
| 2819 Industrial inorganic chemicals n.e.c. | | 3 | 2 | 192.6 | 1.5500 | 97 |
| 3331 Primary copper | | 1 | 1 | 456.8 | 9.5296 | 100 |
| 3441 Fabricated structural metal | | 21 | 4 | 79.1 | 1.1352 | 51 |
| 3532 Mining machinery | | 4 | 2 | 93.4 | 2.6674 | 91 |
| 3573 Electronic computing equipment | | 4 | 3 | 431.5 | 1.4768 | 99 |
| 3589 Service-industry machinery n.e.c. | | 1 | 1 | 147.5 | 4.0736 | 100 |
| 3724 Aircraft engines & engine parts | | 1 | 1 | 217.4 | 1.8398 | 100 |
| 3841 Surgical & medical instruments | | 4 | 2 | 169.2 | 5.2844 | 97 |
| **San Juan** | **All mfg.** | **6** | **1** | **34.0** | **.0018** | **15** |
| **Sanpete** | **All mfg.** | **9** | **3** | **48.1** | **.0025** | **60** |
| **Sevier** | **All mfg.** | **10** | **1** | **101.3** | **.0053** | **18** |
| **Summit** | **All mfg.** | **7** | **1** | **46.7** | **.0024** | **52** |
| **Tooele** 245 | **All mfg.** | **8** | **1** | **41.7** | **.0022** | **20** |
| **Uintah** | **All mfg.** | **3** | | **6.4** | **.0003** | **0** |
| **Utah** 222 | **All mfg.** | **89** | **25** | **1,401.0** | **.0727** | **80** |
| 3312 Blast furnaces & steel mills | | 1 | 1 | 827.5 | 1.4481 | 100 |
| **Wasatch** | **All mfg.** | **4** | **1** | **27.6** | **.0014** | **43** |
| **Washington** | **All mfg.** | **6** | **2** | **34.6** | **.0018** | **63** |
| **Weber** 245 | **All mfg.** | **67** | **23** | **710.3** | **.0369** | **71** |
| **State Total** | **All mfg.** | **769** | **200** | **10,680.3** | **.5545** | **75** |

## VERMONT

| | | | | | | |
|---|---|---|---|---|---|---|
| **Addison** | **All mfg.** | **16** | **6** | **165.1** | **.0086** | **72** |
| **Bennington** | **All mfg.** | **42** | **16** | **343.5** | **.0178** | **75** |
| **Caledonia** | **All mfg.** | **24** | **5** | **133.5** | **.0069** | **51** |
| **Chittenden** 48 | **All mfg.** | **61** | **21** | **599.7** | **.0311** | **73** |
| 3679 Electronic components n.e.c. | | 4 | 2 | 175.5 | 1.8510 | 98 |
| **Essex** | **All mfg.** | **4** | **3** | **52.1** | **.0027** | **98** |
| **Franklin** | **All mfg.** | **27** | **7** | **296.7** | **.0154** | **70** |
| **Grand Isle** | **All mfg.** | **1** | | **.8** | **.0000** | **0** |

| County SIC | Metro Area Industry | Number Of Plants: Total Plants | Large Plants | Total Shipments ($ Mil.) 1981 (S&MM Est.) | % Of U.S. Shipments | % In Large Plants |
|---|---|---|---|---|---|---|
| **VERMONT** (cont.) | | | | | | |
| **Lamoille** | **All mfg.** | **12** | | **21.1** | **.0011** | **0** |
| **Orange** | **All mfg.** | **18** | **6** | **107.0** | **.0056** | **56** |
| **Orleans** | **All mfg.** | **18** | **6** | **144.3** | **.0075** | **53** |
| **Rutland** | **All mfg.** | **44** | **12** | **415.3** | **.0216** | **76** |
| 3724 | Aircraft engines & engine parts | 2 | 1 | 193.7 | 1.6393 | 96 |
| **Washington** | **All mfg.** | **53** | **7** | **169.7** | **.0088** | **42** |
| 3281 | Cut stone & stone products | 28 | 4 | 49.7 | 8.5942 | 47 |
| **Windham** | **All mfg.** | **45** | **12** | **377.0** | **.0196** | **72** |
| **Windsor** | **All mfg.** | **37** | **12** | **227.4** | **.0118** | **71** |
| 3541 | Metal-cutting machine tools | 4 | 4 | 96.1 | 3.6916 | 100 |
| **State Total** | **All mfg.** | **402** | **113** | **3,053.2** | **.1585** | **69** |
| **VIRGINIA** | | | | | | |
| **Accomack** | **All mfg.** | **19** | **6** | **219.1** | **.0113** | **78** |
| 2016 | Poultry-dressing plants | 2 | 2 | 132.2 | 1.6878 | 100 |
| **Albemarle** 36 | **All mfg.** | **34** | **17** | **596.3** | **.0310** | **92** |
| 2037 | Frozen fruits & vegetables | 1 | 1 | 76.5 | 1.7706 | 100 |
| 3662 | Radio & TV communication equipment | 1 | 1 | 88.3 | .3667 | 100 |
| **Alleghany** | **All mfg.** | **10** | **5** | **564.7** | **.0293** | **97** |
| 2631 | Paperboard mills | 1 | 1 | 261.8 | 2.4456 | 100 |
| 2819 | Industrial inorganic chemicals n.e.c. | 2 | 1 | 230.5 | 1.8550 | 98 |
| **Amelia** | **All mfg.** | **6** | **1** | **19.7** | **.0010** | **37** |
| **Amherst** 164 | **All mfg.** | **15** | **3** | **91.7** | **.0048** | **71** |
| **Appomattox** 164 | **All mfg.** | **8** | **4** | **61.9** | **.0032** | **81** |
| **Arlington** 291 | **All mfg.** | **69** | **12** | **437.7** | **.0227** | **65** |
| 2731 | Book publishing | 1 | 1 | 103.9 | 1.5004 | 100 |
| **Augusta** | **All mfg.** | **49** | **15** | **1,003.4** | **.0521** | **90** |
| 2311 | Men's & boys' suits & coats | 2 | 1 | 42.5 | 1.0327 | 93 |
| 2824 | Noncellulosic synthetic organic fibers | 2 | 2 | 456.2 | 4.5008 | 100 |
| 3613 | Switchgear & switchboard apparatus | 2 | 1 | 142.7 | 2.8104 | 97 |
| **Bath** | **All mfg.** | **2** | | **3.4** | **.0002** | **0** |
| **Bedford** | **All mfg.** | **20** | **7** | **248.1** | **.0129** | **69** |
| 3069 | Fabricated rubber products n.e.c. | 1 | 1 | 56.5 | 1.1528 | 100 |
| **Bland** | **All mfg.** | **1** | **1** | **10.4** | **.0005** | **100** |
| **Botetourt** 232 | **All mfg.** | **11** | **5** | **95.7** | **.0050** | **84** |
| **Brunswick** | **All mfg.** | **13** | **4** | **93.5** | **.0049** | **46** |
| **Buchanan** | **All mfg.** | **5** | | **18.5** | **.0010** | **0** |
| **Buckingham** | **All mfg.** | **4** | **1** | **16.1** | **.0008** | **65** |
| **Campbell** 164 | **All mfg.** | **101** | **40** | **1,630.3** | **.0846** | **84** |
| 2492 | Particleboard | 1 | 1 | 71.6 | 12.7266 | 100 |
| 2819 | Industrial inorganic chemicals n.e.c. | 1 | 1 | 132.5 | 1.0663 | 100 |
| 3321 | Gray-iron foundries | 3 | 3 | 184.1 | 2.1592 | 100 |
| 3662 | Radio & TV communication equipment | 1 | 1 | 353.2 | 1.4666 | 100 |
| **Caroline** | **All mfg.** | **13** | **1** | **42.8** | **.0022** | **14** |
| **Carroll** | **All mfg.** | **12** | **4** | **103.0** | **.0053** | **82** |
| **Charlotte** | **All mfg.** | **10** | **4** | **73.9** | **.0038** | **77** |
| **Chesterfield** 230 | **All mfg.** | **26** | **6** | **364.2** | **.0189** | **80** |
| **Clarke** | **All mfg.** | **3** | **3** | **65.1** | **.0034** | **100** |
| **Culpeper** | **All mfg.** | **12** | **7** | **98.4** | **.0051** | **80** |
| **Dickenson** | **All mfg.** | **1** | **1** | **13.6** | **.0007** | **100** |
| **Dinwiddie** 211 | **All mfg.** | **41** | **13** | **1,352.2** | **.0702** | **92** |
| 2111 | Cigarettes | 2 | 2 | 1,065.2 | 11.2089 | 100 |
| **Essex** | **All mfg.** | **6** | **2** | **63.0** | **.0033** | **78** |
| **Fairfax** 291 | **All mfg.** | **114** | **36** | **933.7** | **.0485** | **70** |
| 3662 | Radio & TV communication equipment | 16 | 7 | 227.8 | .9459 | 88 |
| **Fauquier** | **All mfg.** | **10** | **1** | **37.4** | **.0019** | **21** |
| **Floyd** | **All mfg.** | **7** | **3** | **48.5** | **.0025** | **74** |
| **Fluvanna** 56 | **All mfg.** | **3** | **1** | **43.9** | **.0023** | **79** |
| **Franklin** | **All mfg.** | **25** | **11** | **276.8** | **.0144** | **82** |

DEFINITIONS—**SIC Industry:** Classification by plant's primary product. **N.E.C.:** Not elsewhere classified. **Metro Area Code:** Metro market that county belongs to; see list, page 59. **Total Plants:** 20+ employees. **Large Plants:** 100+ employees. **All mfg.:** Total for all plants with 20+ employees in the county. **Shipments:** Dollar value of all goods produced. **% Of U.S.:** Boldface refers to county's share of total U.S. shipments; lightface to the SIC industry in the county and its share of the industry's total U.S. shipments. **% In Large Plants:** Share of shipments (rounded) from plants with 100+ employees; if the share is 99.5% or more, it shows as 100%.

| County SIC | Metro Area Industry | Number Of Plants: Total Plants | Large Plants | Total Shipments ($ Mil.) 1981 (S&MM Est.) | % Of U.S Shipments | % In Large Plants |
|---|---|---|---|---|---|---|
| **Frederick** | **All mfg.** | **51** | **22** | **612.7** | **.0318** | **83** |
| **Giles** | **All mfg.** | **9** | **4** | **208.2** | **.0108** | **89** |
| 2823 | Cellulosic man-made fibers | 1 | 1 | 156.0 | 9.7947 | 100 |
| **Gloucester** 193 | **All mfg.** | **10** | | **28.4** | **.0015** | **0** |
| **Goochland** 230 | **All mfg.** | **2** | | **4.7** | **.0002** | **0** |
| **Grayson** | **All mfg.** | **29** | **12** | **270.8** | **.0141** | **76** |
| 2511 | Wood household furniture | 3 | 3 | 56.7 | 1.1119 | 100 |
| **Greensville** | **All mfg.** | **18** | **9** | **142.5** | **.0074** | **84** |
| **Halifax** | **All mfg.** | **18** | **11** | **225.7** | **.0117** | **87** |
| **Hampton Ind. City** 193 | **All mfg.** | **45** | **11** | **346.3** | **.0180** | **60** |
| **Hanover** 230 | **All mfg.** | **33** | **3** | **139.2** | **.0072** | **24** |
| **Henrico** 230 | **All mfg.** | **280** | **84** | **5,044.9** | **.2619** | **86** |
| 2052 | Cookies & crackers | 3 | 3 | 157.9 | 4.5301 | 100 |
| 2111 | Cigarettes | 1 | 1 | 1,463.7 | 15.4022 | 100 |
| 2643 | Bags, except textile bags | 6 | 3 | 106.8 | 2.2352 | 83 |
| 2751 | Letterpress commercial printing | 12 | 2 | 42.3 | .8889 | 69 |
| 2752 | Lithographic commercial printing | 17 | 3 | 128.4 | .9638 | 53 |
| 2824 | Noncellulosic synthetic organic fibers | 2 | 1 | 467.0 | 4.6074 | 98 |
| 2834 | Pharmaceutical preparations | 2 | 1 | 182.0 | 1.1076 | 97 |
| 3079 | Miscellaneous plastics products | 7 | 2 | 131.9 | .4829 | 86 |
| 3559 | Special-industry machinery n.e.c. | 9 | 4 | 94.8 | 1.2365 | 74 |
| 3661 | Telephone & telegraph apparatus | 2 | 2 | 97.2 | .7463 | 100 |
| **Henry** | **All mfg.** | **55** | **32** | **1,604.4** | **.0833** | **96** |
| 2211 | Cotton-weaving mills | 1 | 1 | 50.4 | .9200 | 100 |
| 2253 | Knit-outerwear mills | 4 | 4 | 155.6 | 5.6210 | 100 |
| 2321 | Men's & boys' shirts & nightwear | 1 | 1 | 66.0 | 1.5800 | 100 |
| 2492 | Particleboard | 1 | 1 | 43.6 | 7.7497 | 100 |
| 2511 | Wood household furniture | 8 | 7 | 299.1 | 5.8655 | 100 |
| 2824 | Noncellulosic synthetic organic fibers | 1 | 1 | 629.1 | 6.2067 | 100 |
| **Highland** | **All mfg.** | **2** | **1** | **7.8** | **.0004** | **67** |
| **Isle of Wight** | **All mfg.** | **6** | **3** | **648.0** | **.0336** | **97** |
| 2011 | Meat-packing plants | 2 | 2 | 613.8 | 1.4454 | 100 |
| **James City** 193 | **All mfg.** | **5** | **2** | **36.0** | **.0019** | **69** |
| **King and Queen** | **All mfg.** | **4** | | **23.6** | **.0012** | **0** |
| **King George** | **All mfg.** | **5** | **2** | **88.8** | **.0046** | **92** |
| **King William** | **All mfg.** | **4** | **1** | **136.7** | **.0071** | **82** |
| **Lancaster** | **All mfg.** | **20** | | **72.9** | **.0038** | **0** |
| **Lee** | **All mfg.** | **7** | **3** | **45.2** | **.0023** | **65** |
| **Loudoun** 291 | **All mfg.** | **20** | **3** | **87.7** | **.0046** | **27** |
| **Louisa** | **All mfg.** | **10** | **4** | **80.0** | **.0042** | **84** |
| **Lunenberg** | **All mfg.** | **16** | **7** | **95.1** | **.0049** | **71** |
| **Madison** | **All mfg.** | **6** | **1** | **26.6** | **.0014** | **61** |
| **Mathews** | **All mfg.** | **1** | | **3.0** | **.0002** | **0** |
| **Mecklenburg** | **All mfg.** | **25** | **13** | **226.1** | **.0117** | **83** |
| **Middlesex** | **All mfg.** | **6** | | **19.5** | **.0010** | **0** |
| **Montgomery** | **All mfg.** | **35** | **18** | **672.8** | **.0349** | **88** |
| 2892 | Explosives | 1 | 1 | 294.4 | 27.9105 | 100 |
| 3621 | Motors & generators | 4 | 4 | 84.1 | 1.3008 | 100 |
| **Nelson** | **All mfg.** | **6** | **1** | **15.3** | **.0008** | **33** |
| **New Kent** 230 | **All mfg.** | **5** | | **28.3** | **.0015** | **0** |
| **Newport News I. C.** 193 | **All mfg.** | **42** | **18** | **1,839.3** | **.0955** | **96** |
| 3731 | Ship building & repairing | 2 | 2 | 1,428.9 | 11.9482 | 100 |
| **Norfolk** 195 | **All mfg.** | **189** | **56** | **2,776.7** | **.1442** | **80** |
| 2435 | Hardwood veneer & plywood | 5 | 4 | 61.7 | 3.8390 | 95 |
| 2711 | Newspapers | 2 | 1 | 63.8 | .3489 | 93 |
| 3651 | Radio & TV receiving sets | 1 | 1 | 334.8 | 3.8703 | 100 |
| 3711 | Motor vehicles & passenger-car bodies | 1 | 1 | 595.3 | .6776 | 100 |
| 3731 | Ship building & repairing | 13 | 8 | 311.7 | 2.6064 | 94 |
| **Northampton** | **All mfg.** | **11** | **6** | **87.7** | **.0046** | **83** |
| **Northumberland** | **All mfg.** | **15** | **1** | **146.4** | **.0076** | **56** |
| **Nottoway** | **All mfg.** | **14** | **6** | **92.0** | **.0048** | **71** |
| **Orange** | **All mfg.** | **19** | **6** | **180.3** | **.0094** | **78** |
| **Page** | **All mfg.** | **10** | **5** | **211.6** | **.0110** | **92** |
| 2328 | Men's & boys' work clothing | 2 | 1 | 102.1 | 1.8976 | 95 |
| **Patrick** | **All mfg.** | **7** | **5** | **63.8** | **.0033** | **93** |
| **Pittsylvania** 71 | **All mfg.** | **52** | **24** | **990.8** | **.0514** | **90** |
| 2211 | Cotton-weaving mills | 1 | 1 | 138.9 | 2.5354 | 100 |
| 3011 | Tires & inner tubes | 1 | 1 | 251.9 | 2.3125 | 100 |
| 3524 | Lawn & garden equipment | 1 | 1 | 63.5 | 3.3234 | 100 |
| **Powhatan** 230 | **All mfg.** | **5** | | **13.6** | **.0007** | **0** |
| **Prince Edward** | **All mfg.** | **8** | **4** | **64.4** | **.0033** | **86** |
| **Prince George** 211 | **All mfg.** | **19** | **9** | **1,577.1** | **.0819** | **97** |

| County / SIC | Metro Area / Industry | Number Of Plants: Total Plants | Large Plants | Total Shipments ($ Mil.) | % Of U.S. Shipments | % In Large Plants |
|---|---|---|---|---|---|---|
| 2824 | Noncellulosic synthetic organic fibers | 2 | 2 | 401.0 | 3.9562 | 100 |
| 2869 | Industrial organic chemicals n.e.c. | 2 | 2 | 855.8 | 2.4621 | 100 |
| **Prince William** | **291 All mfg.** | **27** | **4** | **327.9** | **.0170** | **76** |
| 3679 | Electronic components n.e.c. | 1 | 1 | 81.7 | .8617 | 100 |
| **Pulaski** | **All mfg.** | **23** | **10** | **265.7** | **.0138** | **85** |
| 2511 | Wood household furniture | 3 | 2 | 86.4 | 1.6944 | 98 |
| **Rappahannock** | **All mfg.** | **1** | **1** | **10.8** | **.0006** | **100** |
| **Richmond** | **All mfg.** | **6** | **1** | **35.9** | **.0019** | **54** |
| **Roanoke** | **232 All mfg.** | **140** | **45** | **1,683.9** | **.0874** | **79** |
| 2511 | Wood household furniture | 2 | 2 | 54.5 | 1.0688 | 100 |
| 3622 | Industrial controls | 1 | 1 | 180.9 | 5.2166 | 100 |
| **Rockbridge** | **All mfg.** | **18** | **6** | **207.6** | **.0108** | **75** |
| 2272 | Tufted carpets & rugs | 1 | 1 | 109.6 | 2.0575 | 100 |
| **Rockingham** | **All mfg.** | **56** | **25** | **714.1** | **.0371** | **83** |
| 2016 | Poultry-dressing plants | 4 | 4 | 161.5 | 2.0618 | 100 |
| **Russell** | **All mfg.** | **5** | **2** | **33.3** | **.0017** | **73** |
| **Scott** | **131 All mfg.** | **7** | **4** | **73.0** | **.0038** | **81** |
| **Shenandoah** | **All mfg.** | **33** | **11** | **288.5** | **.0150** | **74** |
| **Smyth** | **All mfg.** | **28** | **19** | **362.1** | **.0188** | **86** |
| **Southampton** | **All mfg.** | **23** | **9** | **420.2** | **.0218** | **87** |
| 2492 | Particleboard | 1 | 1 | 31.2 | 5.5457 | 100 |
| 2621 | Paper mills, except building paper | 1 | 1 | 168.7 | .8891 | 100 |
| **Spotsylvania** | **All mfg.** | **34** | **9** | **195.2** | **.0101** | **63** |
| **Stafford** | **All mfg.** | **3** | | **8.7** | **.0005** | **0** |
| **Suffolk Ind. City** | **195 All mfg.** | **38** | **5** | **325.0** | **.0169** | **49** |
| 2065 | Confectionery products | 3 | 2 | 128.9 | 2.2391 | 94 |
| **Surry** | **All mfg.** | **3** | | **37.0** | **.0019** | **0** |
| **Sussex** | **All mfg.** | **8** | **3** | **36.4** | **.0019** | **59** |
| **Tazewell** | **All mfg.** | **59** | **15** | **376.9** | **.0196** | **60** |
| **Warren** | **All mfg.** | **9** | **3** | **227.0** | **.0118** | **93** |
| 2823 | Cellulosic man-made fibers | 1 | 1 | 172.6 | 10.8369 | 100 |
| **Washington** | **131 All mfg.** | **56** | **28** | **654.4** | **.0340** | **96** |
| **Westmoreland** | **All mfg.** | **16** | **3** | **86.7** | **.0045** | **4** |
| **Wise** | **All mfg.** | **15** | **3** | **250.8** | **.0130** | **78** |
| 3312 | Blast furnaces & steel mills | 2 | 1 | 177.1 | .3099 | 93 |
| **Wythe** | **All mfg.** | **17** | **8** | **100.3** | **.0052** | **77** |
| **York** | **193 All mfg.** | **14** | **6** | **736.6** | **.0382** | **97** |
| **State Total** | **All mfg.** | **2,413** | **821** | **35,068.9** | **1.8208** | **83** |

## WASHINGTON

| | | | | | | |
|---|---|---|---|---|---|---|
| **Adams** | **All mfg.** | **2** | **1** | **59.9** | **.0031** | **96** |
| **Asotin** | **All mfg.** | **2** | | **10.9** | **.0006** | **0** |
| **Benton** | **229 All mfg.** | **20** | **6** | **197.4** | **.0102** | **70** |
| **Chelan** | **All mfg.** | **28** | **9** | **354.7** | **.0184** | **78** |
| 3334 | Primary aluminum | 2 | 1 | 169.1 | 2.8840 | 95 |
| **Clallam** | **All mfg.** | **22** | **5** | **326.0** | **.0169** | **66** |
| **Clark** | **218 All mfg.** | **54** | **18** | **1,278.7** | **.0664** | **88** |
| 2621 | Paper mills, except building paper | 2 | 2 | 556.5 | 2.9328 | 100 |
| 3334 | Primary aluminum | 1 | 1 | 281.8 | 4.8062 | 100 |
| **Columbia** | **All mfg.** | **1** | **1** | **7.3** | **.0004** | **100** |
| **Cowlitz** | **All mfg.** | **39** | **14** | **1,145.6** | **.0595** | **88** |
| 2421 | General sawmills & planing mills | 3 | 1 | 168.6 | 1.2433 | 91 |
| 2621 | Paper mills, except building paper | 2 | 2 | 210.3 | 1.1083 | 100 |
| 2631 | Paperboard mills | 1 | 1 | 174.5 | 1.6301 | 100 |
| 3334 | Primary aluminum | 1 | 1 | 161.1 | 2.7476 | 100 |
| **Douglas** | **All mfg.** | **1** | **1** | **18.6** | **.0010** | **100** |
| **Ferry** | **All mfg.** | **2** | | **16.0** | **.0008** | **0** |
| **Franklin** | **229 All mfg.** | **11** | **5** | **155.5** | **.0081** | **81** |
| 2037 | Frozen fruits & vegetables | 2 | 2 | 84.0 | 1.9442 | 100 |
| **Grant** | **All mfg.** | **16** | **4** | **278.6** | **.0145** | **87** |
| **Grays Harbor** | **All mfg.** | **46** | **19** | **1,713.2** | **.0890** | **95** |
| 2411 | Logging camps & contractors | 5 | 3 | 1,065.5 | 13.1908 | 98 |
| 2611 | Pulp mills | 2 | 2 | 235.4 | 7.5526 | 100 |
| **Island** | **All mfg.** | **5** | **2** | **49.9** | **.0026** | **79** |
| **Jefferson** | **All mfg.** | **5** | **2** | **96.7** | **.0050** | **80** |
| **King** | **256 All mfg.** | **722** | **161** | **13,365.8** | **.6940** | **86** |
| 2026 | Fluid milk | 7 | 5 | 282.2 | 1.5671 | 93 |
| 2051 | Bread, cake, & related products | 10 | 7 | 126.8 | 1.1054 | 96 |
| 2086 | Bottled & canned soft drinks | 8 | 2 | 136.5 | .9281 | 74 |
| 2091 | Canned & cured seafoods | 8 | 3 | 124.4 | 7.4755 | 81 |
| 2329 | Men's & boys' clothing n.e.c. | 7 | 5 | 33.0 | 2.1772 | 91 |
| 2711 | Newspapers | 11 | 4 | 175.3 | .9587 | 91 |
| 2751 | Letterpress commercial printing | 22 | 3 | 49.6 | .8078 | 42 |
| 3273 | Ready-mixed concrete | 12 | 4 | 132.6 | 1.4676 | 74 |
| 3312 | Blast furnaces & steel mills | 2 | 2 | 267.1 | .4674 | 100 |
| 3441 | Fabricated structural metal | 12 | 3 | 69.0 | .9903 | 70 |
| 3599 | Machinery, except electrical, n.e.c. | 29 | 2 | 108.8 | .8158 | 28 |
| 3662 | Radio & TV communication equipment | 10 | 5 | 658.1 | 2.7327 | 98 |
| 3713 | Truck & bus bodies | 4 | 1 | 61.4 | 1.5710 | 91 |
| 3721 | Aircraft | 5 | 4 | 4,377.8 | 17.5721 | 100 |
| 3728 | Aircraft equipment n.e.c. | 18 | 4 | 775.1 | 9.6751 | 95 |
| 3731 | Ship building & repairing | 9 | 5 | 439.7 | 3.6767 | 96 |
| 3732 | Boat building & repairing | 8 | 2 | 74.2 | 3.6139 | 86 |
| 3743 | Railroad equipment | 1 | 1 | 156.3 | 2.9211 | 100 |
| 3761 | Guided missiles & space vehicles | 2 | 2 | 1,571.3 | 21.3448 | 100 |
| 3769 | Space-vehicle equipment n.e.c. | 2 | 2 | 253.1 | 25.0867 | 100 |
| **Kitsap** | **42 All mfg.** | **12** | **3** | **57.8** | **.0030** | **52** |
| **Kittitas** | **All mfg.** | **10** | **4** | **126.3** | **.0066** | **70** |
| **Klickitat** | **All mfg.** | **7** | **4** | **197.4** | **.0102** | **90** |
| **Lewis** | **All mfg.** | **41** | **17** | **587.9** | **.0305** | **83** |
| **Lincoln** | **All mfg.** | **1** | **1** | **11.4** | **.0006** | **100** |
| **Mason** | **All mfg.** | **10** | **3** | **137.2** | **.0071** | **71** |
| 2661 | Building-paper & building-board mills | 1 | 1 | 84.3 | 14.1443 | 100 |
| **Okanogan** | **All mfg.** | **12** | **2** | **179.7** | **.0093** | **50** |
| 2421 | General sawmills & planing mills | 3 | 2 | 92.0 | .6776 | 97 |
| **Pacific** | **All mfg.** | **10** | **2** | **107.7** | **.0056** | **30** |
| **Pend Oreille** | **All mfg.** | **5** | **1** | **51.3** | **.0027** | **62** |
| **Pierce** | **273 All mfg.** | **170** | **44** | **1,947.3** | **.1011** | **68** |
| 2421 | General sawmills & planing mills | 7 | 3 | 165.2 | 1.2168 | 91 |
| **Skagit** | **All mfg.** | **30** | **11** | **1,870.4** | **.0971** | **96** |
| **Skamania** | **All mfg.** | **4** | **3** | **60.2** | **.0031** | **84** |
| **Snohomish** | **256 All mfg.** | **121** | **29** | **2,106.1** | **.1094** | **85** |
| 2037 | Frozen fruits & vegetables | 5 | 2 | 111.2 | 2.5737 | 95 |
| 2421 | General sawmills & planing mills | 10 | 4 | 175.7 | 1.2941 | 88 |
| 2431 | Millwork | 5 | 1 | 58.1 | 1.2315 | 82 |
| 2647 | Sanitary paper products | 1 | 1 | 233.1 | 3.4897 | 100 |
| 3721 | Aircraft | 2 | 2 | 767.7 | 3.0815 | 100 |
| 3825 | Electricity-measuring instruments | 1 | 1 | 108.1 | 2.2389 | 100 |
| **Spokane** | **264 All mfg.** | **151** | **35** | **1,975.8** | **.1026** | **77** |
| 3334 | Primary aluminum | 1 | 1 | 241.5 | 4.1188 | 100 |
| 3353 | Aluminum sheet, plate, & foil | 1 | 1 | 566.3 | 7.5273 | 100 |
| **Stevens** | **All mfg.** | **16** | **3** | **145.9** | **.0076** | **56** |
| **Thurston** | **200 All mfg.** | **26** | **10** | **246.4** | **.0128** | **77** |
| **Wahkiakum** | **All mfg.** | **1** | **1** | **99.0** | **.0051** | **100** |
| **Walla Walla** | **All mfg.** | **20** | **6** | **225.1** | **.0117** | **81** |
| **Whatcom** | **30 All mfg.** | **48** | **19** | **1,787.3** | **.0928** | **91** |
| 2611 | Pulp mills | 1 | 1 | 134.5 | 4.3153 | 100 |
| 3334 | Primary aluminum | 2 | 2 | 209.2 | 3.5680 | 100 |
| **Whitman** | **All mfg.** | **2** | | **10.1** | **.0005** | **0** |
| **Yakima** | **302 All mfg.** | **88** | **19** | **713.8** | **.0371** | **56** |
| 2033 | Canned fruits & vegetables | 10 | 5 | 157.0 | 1.9718 | 93 |
| **State Total** | **All mfg.** | **1,761** | **465** | **31,718.9** | **1.6469** | **84** |

## WEST VIRGINIA

| | | | | | | |
|---|---|---|---|---|---|---|
| **Barbour** | **All mfg.** | **6** | | **19.3** | **.0010** | **0** |
| **Berkeley** | **All mfg.** | **25** | **11** | **389.5** | **.0202** | **88** |
| 3714 | Motor-vehicle parts & accessories | 2 | 2 | 112.5 | .2729 | 100 |
| **Boone** | **All mfg.** | **2** | | **8.0** | **.0004** | **0** |
| **Braxton** | **All mfg.** | **4** | **1** | **16.6** | **.0009** | **33** |
| **Brooke** | **270 All mfg.** | **16** | **8** | **325.6** | **.0169** | **89** |
| **Cabell** | **121 All mfg.** | **64** | **19** | **1,372.7** | **.0713** | **87** |
| 3221 | Glass containers | 2 | 2 | 109.9 | 3.0213 | 100 |
| 3312 | Blast furnaces & steel mills | 1 | 1 | 173.8 | .3041 | 100 |
| 3356 | Nonferrous rolling & drawing n.e.c. | 1 | 1 | 430.4 | 13.4064 | 100 |
| 3743 | Railroad equipment | 1 | 1 | 84.5 | 1.5792 | 100 |
| **Calhoun** | **All mfg.** | **2** | **1** | **8.7** | **.0005** | **93** |
| **Clay** | **All mfg.** | **2** | | **4.0** | **.0002** | **0** |
| **Doddridge** | **All mfg.** | **1** | | **2.4** | **.0001** | **0** |
| **Fayette** | **All mfg.** | **9** | **2** | **217.2** | **.0113** | **93** |
| 3313 | Electrometallurgical products | 1 | 1 | 177.1 | 13.9427 | 100 |

| County SIC | Metro Area Industry | Number Of Plants: Total Plants | Large Plants | Total Shipments ($ Mil.) | % Of U.S. Shipments | % In Large Plants |
|---|---|---|---|---|---|---|
| **WEST VIRGINIA** (cont.) | | | | | | |
| **Gilmer** | **All mfg.** | 2 | 1 | 21.6 | .0011 | 77 |
| **Grant** | **All mfg.** | 6 | 1 | 27.2 | .0014 | 24 |
| **Greenbrier** | **All mfg.** | 17 | 5 | 103.4 | .0054 | 57 |
| **Hampshire** | **All mfg.** | 3 | | 8.6 | .0004 | 0 |
| **Hancock** 270 | **All mfg.** | 28 | 14 | 2,805.4 | .1457 | 98 |
| 3262 | Vitreous china food utensils | 1 | 1 | 60.8 | 24.3395 | 100 |
| 3312 | Blast furnaces & steel mills | 1 | 1 | 2,112.9 | 3.6974 | 100 |
| **Hardy** | **All mfg.** | 4 | 2 | 37.6 | .0020 | 92 |
| **Harrison** | **All mfg.** | 33 | 12 | 350.3 | .0182 | 72 |
| 3229 | Pressed & blown glass n.e.c. | 2 | 2 | 36.3 | 1.7287 | 100 |
| **Jackson** | **All mfg.** | 4 | 2 | 878.3 | .0456 | 100 |
| 3353 | Aluminum sheet, plate, & foil | 1 | 1 | 836.0 | 11.1121 | 100 |
| **Jefferson** | **All mfg.** | 9 | 4 | 117.8 | .0061 | 88 |
| **Kanawha** 54 | **All mfg.** | 89 | 24 | 3,385.0 | .1758 | 92 |
| 2812 | Alkalies & chlorine | 1 | 1 | 125.1 | 5.1586 | 100 |
| 2824 | Noncellulosic synthetic organic fibers | 1 | 1 | 267.3 | 2.6372 | 100 |
| 2869 | Industrial organic chemicals n.e.c. | 6 | 4 | 1,705.9 | 4.9078 | 98 |
| **Lewis** | **All mfg.** | 8 | 4 | 55.7 | .0029 | 85 |
| **Logan** | **All mfg.** | 14 | 2 | 57.2 | .0030 | 33 |
| **McDowell** | **All mfg.** | 2 | | 7.5 | .0004 | 0 |
| **Marion** | **All mfg.** | 35 | 7 | 361.9 | .0188 | 79 |
| 3641 | Electric lamps | 1 | 1 | 117.9 | 5.1370 | 100 |
| **Marshall** 295 | **All mfg.** | 16 | 7 | 371.4 | .0193 | 89 |
| 3944 | Games, toys, & children's vehicles | 1 | 1 | 73.4 | 2.0749 | 100 |
| **Mason** | **All mfg.** | 9 | 3 | 157.0 | .0082 | 82 |
| **Mercer** | **All mfg.** | 26 | 8 | 163.1 | .0085 | 64 |
| **Mineral** 69 | **All mfg.** | 8 | 2 | 45.1 | .0023 | 49 |
| **Mingo** | **All mfg.** | 9 | | 26.3 | .0014 | 0 |
| **Monongalia** | **All mfg.** | 28 | 11 | 233.7 | .0121 | 75 |
| **Monroe** | **All mfg.** | 1 | 1 | 13.3 | .0007 | 100 |
| **Morgan** | **All mfg.** | 6 | 2 | 50.9 | .0026 | 78 |
| **Nicholas** | **All mfg.** | 15 | 4 | 95.2 | .0049 | 59 |
| **Ohio** 395 | **All mfg.** | 37 | 14 | 372.8 | .0194 | 74 |
| 3547 | Rolling-mill machinery | 2 | 2 | 91.8 | 19.9132 | 100 |
| **Pendelton** | **All mfg.** | 3 | 1 | 22.8 | .0012 | 84 |
| **Pleasants** | **All mfg.** | 2 | 2 | 547.2 | .0284 | 100 |
| **Pocahontas** | **All mfg.** | 4 | 1 | 24.2 | .0013 | 60 |
| **Preston** | **All mfg.** | 9 | 3 | 71.7 | .0037 | 42 |
| **Putnam** 54 | **All mfg.** | 8 | 1 | 26.9 | .0014 | 49 |
| **Raleigh** | **All mfg.** | 27 | 3 | 110.6 | .0057 | 39 |
| **Randolph** | **All mfg.** | 21 | 5 | 92.3 | .0048 | 42 |
| **Ritchie** | **All mfg.** | 10 | 3 | 55.9 | .0029 | 50 |
| **Roane** | **All mfg.** | 8 | 3 | 95.7 | .0050 | 86 |
| **Summers** | **All mfg.** | 3 | 1 | 12.1 | .0006 | 50 |
| **Taylor** | **All mfg.** | 6 | 4 | 45.0 | .0023 | 91 |
| **Tucker** | **All mfg.** | 8 | 3 | 85.7 | .0044 | 75 |
| **Tyler** | **All mfg.** | 2 | 1 | 159.5 | .0083 | 98 |
| **Upshur** | **All mfg.** | 7 | 3 | 69.8 | .0036 | 82 |
| **Wayne** 121 | **All mfg.** | 15 | 4 | 173.9 | .0090 | 77 |
| **Webster** | **All mfg.** | 4 | | 11.0 | .0006 | 0 |
| **Wetzel** | **All mfg.** | 11 | 5 | 289.1 | .0150 | 94 |
| **Wirt** 206 | **All mfg.** | 1 | | 1.0 | .0001 | 0 |
| **Wood** 206 | **All mfg.** | 50 | 18 | 1,115.8 | .0579 | 87 |
| 2821 | Plastics materials & synthetic resins | 2 | 2 | 611.6 | 3.7389 | 100 |
| 3423 | Hand & edge tools n.e.c. | 1 | 1 | 94.1 | 3.0633 | 100 |
| **Wyoming** | **All mfg.** | 5 | | 12.0 | .0006 | 0 |
| **State Total** | **All mfg.** | 744 | 235 | 15,132.5 | .7857 | 88 |

DEFINITIONS—**SIC Industry:** Classification by plant's primary product. **N.E.C.:** Not elsewhere classified. **Metro Area Code:** Metro market that county belongs to; see list, page 59. **Total Plants:** 20+ employees. **Large Plants:** 100+ employees. **All mfg.:** Total for all plants with 20+ employees in the county. **Shipments:** Dollar value of all goods produced. **% Of U.S.:** Boldface refers to county's share of total U.S. shipments; lightface to the SIC industry in the county and its share of the industry's total U.S. shipments. **% In Large Plants:** Share of shipments (rounded) from plants with 100+ employees; if the share is 99.5% or more, it shows as 100%.

| County SIC | Metro Area Industry | Number Of Plants: Total Plants | Large Plants | Total Shipments ($ Mil.) | % Of U.S. Shipments | % In Large Plants |
|---|---|---|---|---|---|---|
| **WISCONSIN** | | | | | | |
| **Adams** | **All mfg.** | 4 | 1 | 23.4 | .0012 | 73 |
| **Ashland** | **All mfg.** | 10 | 4 | 80.6 | .0042 | 67 |
| **Barron** | **All mfg.** | 35 | 11 | 305.6 | .0159 | 66 |
| **Bayfield** | **All mfg.** | 1 | 1 | 10.1 | .0005 | 100 |
| **Brown** 111 | **All mfg.** | 126 | 34 | 2,485.3 | .1290 | 84 |
| 2621 | Paper mills, except building paper | 4 | 4 | 452.8 | 2.3863 | 100 |
| 2647 | Sanitary paper products | 8 | 5 | 721.3 | 10.7984 | 95 |
| 3554 | Paper-industries machinery | 6 | 2 | 128.2 | 7.7467 | 86 |
| **Buffalo** | **All mfg.** | 1 | | 16.6 | .0009 | 0 |
| **Burnett** | **All mfg.** | 9 | 1 | 26.4 | .0014 | 17 |
| **Calumet** 16 | **All mfg.** | 23 | 7 | 539.4 | .0280 | 77 |
| 3519 | Internal-combustion engines n.e.c. | 1 | 1 | 248.5 | 2.1722 | 100 |
| **Chippewa** 81 | **All mfg.** | 35 | 12 | 250.6 | .0130 | 74 |
| **Clark** | **All mfg.** | 23 | 2 | 140.2 | .0073 | 21 |
| **Columbia** | **All mfg.** | 43 | 12 | 234.9 | .0122 | 55 |
| **Crawford** | **All mfg.** | 9 | 3 | 130.4 | .0068 | 90 |
| **Dane** 167 | **All mfg.** | 167 | 45 | 3,064.1 | .1591 | 84 |
| 2011 | Meat-packing plants | 1 | 1 | 1,197.7 | 2.8203 | 100 |
| 2439 | Structural wood members n.e.c. | 4 | 2 | 47.3 | 4.9742 | 92 |
| 3692 | Dry & wet primary batteries | 1 | 1 | 82.4 | 8.9100 | 100 |
| **Dodge** | **All mfg.** | 58 | 18 | 540.2 | .0280 | 77 |
| 3524 | Lawn & garden equipment | 1 | 1 | 87.5 | 4.5795 | 100 |
| **Door** | **All mfg.** | 16 | 8 | 343.9 | .0179 | 95 |
| 3731 | Ship building & repairing | 2 | 2 | 168.6 | 1.4098 | 100 |
| **Douglas** 80 | **All mfg.** | 13 | 4 | 406.2 | .0211 | 88 |
| **Dunn** | **All mfg.** | 11 | 2 | 61.7 | .0032 | 54 |
| **Eau Claire** 81 | **All mfg.** | 32 | 11 | 739.2 | .0384 | 83 |
| 3011 | Tires & inner tubes | 1 | 1 | 282.8 | 2.5961 | 100 |
| **Florence** | **All mfg.** | 1 | | 2.6 | .0001 | 0 |
| **Fond du Lac** | **All mfg.** | 66 | 20 | 904.5 | .0470 | 76 |
| 3519 | Internal-combustion engines n.e.c. | 2 | 1 | 227.9 | 1.9922 | 96 |
| **Forest** | **All mfg.** | 2 | 2 | 17.3 | .0009 | 100 |
| **Grant** | **All mfg.** | 13 | | 68.2 | .0035 | 0 |
| **Green** | **All mfg.** | 24 | 9 | 273.4 | .0142 | 52 |
| **Green Lake** | **All mfg.** | 28 | 3 | 133.6 | .0069 | 45 |
| **Iowa** | **All mfg.** | 9 | | 23.0 | .0012 | 0 |
| **Iron** | **All mfg.** | 5 | 1 | 40.8 | .0021 | 61 |
| **Jackson** | **All mfg.** | 8 | 1 | 59.8 | .0031 | 38 |
| **Jefferson** | **All mfg.** | 77 | 24 | 984.3 | .0511 | 80 |
| 3079 | Miscellaneous plastics products | 8 | 4 | 99.1 | .3628 | 93 |
| 3585 | Refrigeration & heating equipment | 1 | 1 | 168.2 | .8040 | 100 |
| **Juneau** | **All mfg.** | 17 | 5 | 155.0 | .0080 | 68 |
| **Kenosha** 137 | **All mfg.** | 50 | 17 | 3,015.1 | .1565 | 97 |
| 3423 | Hand & edge tools n.e.c. | 1 | 1 | 58.9 | 1.9174 | 100 |
| 3711 | Motor vehicles & passenger-car bodies | 2 | 1 | 2,392.5 | 2.7231 | 100 |
| **Kewaunee** | **All mfg.** | 15 | 4 | 145.6 | .0076 | 68 |
| **La Crosse** 141 | **All mfg.** | 50 | 14 | 741.3 | .0385 | 86 |
| 3585 | Refrigeration & heating equipment | 1 | 1 | 336.4 | 1.6080 | 100 |
| **Lafayette** | **All mfg.** | 3 | 1 | 40.9 | .0021 | 45 |
| **Langlade** | **All mfg.** | 17 | 5 | 113.1 | .0059 | 55 |
| **Lincoln** | **All mfg.** | 27 | 10 | 336.4 | .0175 | 83 |
| **Manitowoc** | **All mfg.** | 75 | 23 | 996.3 | .0517 | 83 |
| 3361 | Aluminum foundries | 4 | 4 | 182.8 | 5.9741 | 100 |
| 3585 | Refrigeration & heating equipment | 2 | 2 | 210.4 | 1.0057 | 100 |
| 3842 | Surgical appliances & supplies | 1 | 1 | 127.1 | 2.7265 | 100 |
| **Marathon** 293 | **All mfg.** | 75 | 29 | 1,377.4 | .0715 | 85 |
| 2022 | Natural & processed cheese | 5 | 2 | 388.0 | 4.0280 | 82 |
| 2435 | Hardwood veneer & plywood | 2 | 1 | 51.8 | 3.2230 | 97 |
| 2621 | Paper mills, except building paper | 3 | 3 | 229.4 | 1.2090 | 100 |
| 3531 | Construction machinery | 2 | 2 | 146.6 | .7132 | 100 |
| 3621 | Motors & generators | 1 | 1 | 56.0 | .8662 | 100 |
| **Marinette** | **All mfg.** | 32 | 14 | 581.7 | .0302 | 90 |
| 2621 | Paper mills, except building paper | 3 | 2 | 141.6 | .7463 | 96 |
| **Marquette** | **All mfg.** | 4 | 1 | 29.9 | .0016 | 36 |
| **Menominee** | **All mfg.** | 1 | 1 | 35.1 | .0018 | 100 |
| **Milwaukee** 175 | **All mfg.** | 852 | 273 | 13,226.6 | .6919 | 85 |
| 2051 | Bread, cake, & related products | 7 | 6 | 106.7 | .9302 | 97 |
| 2082 | Malt beverages | 3 | 3 | 1,478.4 | 15.0620 | 100 |
| 2531 | Public-building & related furniture | 7 | 3 | 44.8 | 4.6667 | 87 |
| 2641 | Paper coating & glazing | 3 | 1 | 118.0 | 2.5303 | 89 |
| 2653 | Corrugated & solid fiber boxes | 10 | 6 | 121.6 | 1.1745 | 86 |

| County / SIC | Metro Area / Industry | Number Of Plants: Total Plants | Number Of Plants: Large Plants | Total Shipments ($ Mil) 1981 (S&MM Est) | % Of U S Shipments | % In Large Plants |
|---|---|---|---|---|---|---|
| 2711 | Newspapers | 3 | 2 | 67.6 | .3697 | 97 |
| 2752 | Lithographic commercial printing | 22 | 6 | 197.4 | 1.4817 | 67 |
| 3079 | Miscellaneous plastics products | 27 | 8 | 206.8 | .7572 | 70 |
| 3111 | Leather tanning & finishing | 16 | 8 | 191.5 | 9.1065 | 84 |
| 3143 | Men's nonathletic footwear | 1 | 1 | 43.5 | 1.7551 | 100 |
| 3317 | Steel pipe & tubes | 1 | 1 | 55.3 | 1.5279 | 100 |
| 3321 | Gray-iron foundries | 8 | 5 | 97.1 | 1.1388 | 92 |
| 3325 | Steel foundries n.e.c. | 10 | 9 | 129.6 | 4.7687 | 97 |
| 3411 | Metal cans | 4 | 4 | 319.4 | 3.7326 | 100 |
| 3429 | Hardware n.e.c. | 3 | 1 | 115.1 | 1.6223 | 92 |
| 3443 | Fabricated plate work (boiler shops) | 19 | 9 | 268.4 | 2.6906 | 89 |
| 3444 | Sheet-metal work | 13 | 2 | 66.8 | 1.0296 | 60 |
| 3448 | Prefabricated metal buildings | 2 | 2 | 78.9 | 3.1920 | 100 |
| 3462 | Iron & steel forgings | 4 | 3 | 320.7 | 8.1905 | 100 |
| 3469 | Metal stampings n.e.c. | 13 | 4 | 70.4 | 1.1070 | 65 |
| 3519 | Internal-combustion engines n.e.c. | 5 | 4 | 1,133.4 | 9.9074 | 100 |
| 3523 | Farm machinery & equipment | 1 | 1 | 407.0 | 3.2743 | 100 |
| 3531 | Construction machinery | 16 | 9 | 695.9 | 3.3857 | 92 |
| 3532 | Mining machinery | 5 | 3 | 255.7 | 7.3024 | 96 |
| 3536 | Hoists, industrial cranes, & monorails | 10 | 3 | 139.5 | 10.0715 | 89 |
| 3541 | Metal-cutting machine tools | 9 | 2 | 70.1 | 2.6928 | 84 |
| 3544 | Special dies, tools, jigs, & fixtures | 23 | 3 | 38.4 | 1.1248 | 46 |
| 3551 | Food-products machinery | 4 | 2 | 81.8 | 2.1776 | 93 |
| 3566 | Speed changers, drives, & gears | 3 | 3 | 181.7 | 15.1291 | 100 |
| 3569 | General industrial machinery n.e.c. | 12 | 5 | 66.3 | 2.5888 | 83 |
| 3599 | Machinery, except electrical, n.e.c. | 24 | 6 | 175.4 | 1.3151 | 65 |
| 3612 | Transformers | 5 | 3 | 56.9 | 1.7540 | 94 |
| 3613 | Switchgear & switchboard apparatus | 9 | 3 | 79.3 | 1.5618 | 83 |
| 3621 | Motors & generators | 7 | 3 | 67.8 | 1.0487 | 86 |
| 3622 | Industrial controls | 11 | 7 | 449.0 | 12.9477 | 97 |
| 3662 | Radio & TV communication equipment | 5 | 1 | 107.5 | .4464 | 82 |
| 3693 | X-ray apparatus & tubes | 2 | 2 | 390.9 | 15.6085 | 100 |
| 3714 | Motor-vehicle parts & accessories | 4 | 2 | 354.1 | .8589 | 98 |
| 3751 | Motorcycles, bicycles, & parts | 1 | 1 | 149.8 | 13.6058 | 100 |
| 3822 | Environmental controls | 4 | 4 | 96.6 | 4.2789 | 100 |
| 3993 | Signs & advertising displays | 14 | 4 | 49.3 | 2.3261 | 63 |
| **Monroe** | **All mfg.** | **15** | **5** | **99.2** | **.0052** | **58** |
| **Oconto** | **All mfg.** | **27** | **7** | **249.9** | **.0130** | **68** |
| **Oneida** | **All mfg.** | **9** | **4** | **179.2** | **.0093** | **87** |
| **Outagamie** | **16 All mfg.** | **89** | **34** | **1,871.3** | **.0972** | **91** |
| 2259 | Knitting mills n.e.c. | 1 | 1 | 29.6 | 25.8515 | 100 |
| 2621 | Paper mills, except building paper | 5 | 5 | 642.6 | 3.3866 | 100 |
| 2641 | Paper coating & glazing | 2 | 1 | 191.9 | 4.1150 | 99 |
| 3623 | Electric welding apparatus | 1 | 1 | 99.5 | 5.7876 | 100 |
| **Ozaukee** | **175 All mfg.** | **84** | **30** | **790.0** | **.0410** | **74** |
| 3524 | Lawn & garden equipment | 2 | 2 | 85.7 | 4.4853 | 100 |
| 3621 | Motors & generators | 3 | 3 | 117.8 | 1.8221 | 100 |
| **Pepin** | **All mfg.** | **4** | **1** | **26.7** | **.0014** | **27** |
| **Pierce** | **All mfg.** | **8** | **4** | **86.0** | **.0045** | **73** |
| **Polk** | **All mfg.** | **24** | **8** | **182.7** | **.0095** | **45** |
| **Portage** | **All mfg.** | **26** | **11** | **318.3** | **.0165** | **82** |
| **Price** | **All mfg.** | **12** | **5** | **131.6** | **.0068** | **83** |
| **Racine** | **224 All mfg.** | **166** | **55** | **1,987.8** | **.1032** | **85** |
| 2731 | Book publishing | 1 | 1 | 136.9 | 1.9770 | 100 |
| 2842 | Polishes & sanitation goods | 1 | 1 | 230.9 | 5.3017 | 100 |
| 3523 | Farm machinery & equipment | 5 | 3 | 231.7 | 1.8640 | 97 |
| 3531 | Construction machinery | 5 | 3 | 242.3 | 1.1788 | 97 |
| 3561 | Pumps & pumping equipment | 4 | 2 | 72.8 | 1.8314 | 96 |
| 3568 | Power-transmission equipment n.e.c. | 1 | 1 | 50.6 | 3.2023 | 100 |
| 3621 | Motors & generators | 9 | 5 | 81.7 | 1.26.7 | 91 |
| **Richland** | **All mfg.** | **13** | **4** | **80.3** | **.0042** | **62** |
| **Rock** | **129 All mfg.** | **70** | **24** | **1,756.1** | **.0912** | **90** |
| 3143 | Men's nonathletic footwear | 1 | 1 | 43.5 | 1.7551 | 100 |
| 3519 | Internal-combustion engines n.e.c. | 1 | 1 | 248.5 | 2.1722 | 100 |
| 3554 | Paper-industries machinery | 1 | 1 | 194.9 | 11.7771 | 100 |
| 3711 | Motor vehicles & passenger-car bodies | 1 | 1 | 684.6 | .7792 | 100 |
| 3951 | Pens & mechanical pencils | 1 | 1 | 98.1 | 12.3614 | 100 |
| **Rusk** | **All mfg.** | **10** | **3** | **69.2** | **.0036** | **64** |
| **St. Croix** | **176 All mfg.** | **23** | **5** | **179.3** | **.0093** | **67** |
| **Sauk** | **All mfg.** | **34** | **11** | **388.7** | **.0202** | **77** |
| 3482 | Small-arms ammunition | 2 | 1 | 65.2 | 11.1225 | 97 |
| **Sawyer** | **All mfg.** | **3** | | **19.6** | **.0010** | **0** |

| County / SIC | Metro Area / Industry | Number Of Plants: Total Plants | Number Of Plants: Large Plants | Total Shipments ($ Mil) 1981 (S&MM Est) | % Of U S Shipments | % In Large Plants |
|---|---|---|---|---|---|---|
| **Shawano** | **All mfg.** | **16** | **6** | **210.1** | **.0109** | **72** |
| **Sheboygan** | **258 All mfg.** | **114** | **40** | **1,608.0** | **.0835** | **82** |
| 2022 | Natural & processed cheese | 4 | 3 | 440.9 | 4.5772 | 99 |
| 3431 | Metal sanitary ware | 1 | 1 | 145.8 | 23.1612 | 100 |
| 3519 | Internal-combustion engines n.e.c. | 1 | 1 | 151.9 | 1.3278 | 100 |
| **Taylor** | **All mfg.** | **10** | **7** | **130.2** | **.0068** | **95** |
| **Trempealeau** | **All mfg.** | **17** | **3** | **180.9** | **.0094** | **75** |
| **Vernon** | **All mfg.** | **6** | | **21.0** | **.0011** | **0** |
| **Vilas** | **All mfg.** | **6** | **1** | **29.8** | **.0015** | **43** |
| **Walworth** | **All mfg.** | **76** | **20** | **467.6** | **.0243** | **68** |
| **Washburn** | **All mfg.** | **3** | | **5.2** | **.0003** | **0** |
| **Washington** | **175 All mfg.** | **77** | **25** | **944.4** | **.0490** | **79** |
| 3519 | Internal-combustion engines n.e.c. | 1 | 1 | 146.2 | 1.2780 | 100 |
| 3523 | Farm machinery & equipment | 4 | 2 | 102.4 | .8238 | 96 |
| 3634 | Electric housewares & fans | 2 | 2 | 185.2 | 5.8412 | 100 |
| **Waukesha** | **175 All mfg.** | **323** | **65** | **2,524.3** | **.1311** | **69** |
| 2752 | Lithographic commercial printing | 10 | 2 | 129.0 | .9683 | 69 |
| 3519 | Internal-combustion engines n.e.c. | 2 | 1 | 251.5 | 2.1984 | 99 |
| 3531 | Construction machinery | 3 | 2 | 283.2 | 1.3778 | 97 |
| 3551 | Food-products machinery | 7 | 3 | 134.3 | 3.5752 | 92 |
| 3612 | Transformers | 3 | 2 | 74.7 | 2.3026 | 97 |
| **Waupaca** | **All mfg.** | **50** | **14** | **673.3** | **.0350** | **74** |
| 2013 | Sausages & other prepared meats | 1 | 1 | 149.9 | 1.2681 | 100 |
| **Waushara** | **All mfg.** | **10** | **1** | **35.3** | **.0018** | **26** |
| **Winnebago** | **16 All mfg.** | **134** | **40** | **1,892.0** | **.0982** | **82** |
| 2431 | Millwork | 6 | 3 | 60.7 | 1.2866 | 91 |
| 2621 | Paper mills, except building paper | 8 | 6 | 524.0 | 2.7616 | 97 |
| 2653 | Corrugated & solid fiber boxes | 4 | 2 | 115.3 | 1.1137 | 90 |
| 2732 | Book printing | 1 | 1 | 88.2 | 3.7159 | 100 |
| 3321 | Gray-iron foundries | 2 | 2 | 116.3 | 1.3640 | 100 |
| 3713 | Truck & bus bodies | 2 | 2 | 49.2 | 1.2588 | 100 |
| 3714 | Motor-vehicle parts & accessories | 2 | 1 | 107.2 | .2600 | 97 |
| **Wood** | **All mfg.** | **48** | **20** | **1,062.9** | **.0552** | **84** |
| 2621 | Paper mills, except building paper | 3 | 3 | 472.7 | 2.4912 | 100 |
| **State Total** | **All mfg.** | **3,572** | **1,082** | **51,002.2** | **2.6481** | **82** |

## WYOMING

| | | | | | | |
|---|---|---|---|---|---|---|
| **Albany** | **All mfg.** | **12** | **1** | **47.9** | **.0025** | **30** |
| **Big Horn** | **All mfg.** | **6** | **1** | **47.7** | **.0025** | **38** |
| **Campbell** | **All mfg.** | **3** | | **9.8** | **.0005** | **0** |
| **Carbon** | **All mfg.** | **3** | **1** | **338.3** | **.0176** | **97** |
| **Converse** | **All mfg.** | **2** | | **10.0** | **.0005** | **0** |
| **Crook** | **All mfg.** | **2** | | **5.0** | **.0003** | **0** |
| **Fremont** | **All mfg.** | **14** | **2** | **105.1** | **.0055** | **27** |
| **Goshen** | **All mfg.** | **3** | **1** | **62.2** | **.0032** | **78** |
| **Hot Springs** | **All mfg.** | **1** | | **4.1** | **.0002** | **0** |
| **Johnson** | **All mfg.** | **2** | | **7.0** | **.0004** | **0** |
| **Laramie** | **All mfg.** | **23** | **7** | **481.7** | **.0250** | **86** |
| **Lincoln** | **All mfg.** | **6** | **1** | **70.0** | **.0036** | **48** |
| **Natrona** | **50 All mfg.** | **37** | **8** | **1,683.1** | **.0874** | **68** |
| **Niobrara** | **All mfg.** | **1** | | **3.0** | **.0002** | **0** |
| **Park** | **All mfg.** | **7** | **1** | **260.4** | **.0135** | **87** |
| **Platte** | **All mfg.** | **2** | | **5.3** | **.0003** | **0** |
| **Sheridan** | **All mfg.** | **11** | **1** | **58.2** | **.0030** | **34** |
| **Sweetwater** | **All mfg.** | **6** | **3** | **127.4** | **.0066** | **92** |
| **Teton** | **All mfg.** | **6** | | **14.7** | **.0008** | **0** |
| **Uinta** | **All mfg.** | **4** | | **10.5** | **.0005** | **0** |
| **Washakie** | **All mfg.** | **6** | **2** | **93.0** | **.0048** | **72** |
| **Weston** | **All mfg.** | **5** | | **112.8** | **.0059** | **0** |
| **State Total** | **All mfg.** | **162** | **29** | **3,557.2** | **.1847** | **69** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **NATIONAL TOTAL** | **ALL MFG.** | **142,793** | **42,595** | **1,925,998.7** | **100.0000** | **81** |

# NOTE

ONLY THE FOLLOWING PAGES OF THIS

PUBLICATION HAVE BEEN FILMED

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62-64, 66, 68, 98.